

X. *Synopsis of British Hymenoptera. Diploptera and Anthophila; part I. to end of Andrenidæ.* By EDWARD SAUNDERS, F.L.S.

[Read May 3rd, 1882.]

PLATES VII.—XI.

THE *Diploptera* and *Anthophila* follow in natural order after the *Heterogyna* and *Fossores*, of which I gave a synopsis of the British species in the volume of our 'Transactions' for 1880 (pp. 201—304). I have endeavoured as much as possible to pursue the same method with regard to the analytical tables and descriptions in the Synopsis which I have now to lay before the Society, so that the two together may form a complete descriptive History of our British Aculeate Hymenoptera. In the genera *Halictus* and *Andrena* I have had to describe the species at some length, as they are often so closely allied one to another that detailed descriptions are almost a necessity, and for the same reason the analytical tables in such cases are proportionately unsatisfactory. I have, however, done my best to make them as clear as possible; and I feel sure that any one who knows the difficulty of distinguishing between some of the closely-allied species will not be surprised if in some instances he has to refer to the detailed descriptions, as well as to the tables, in order to name his insect satisfactorily.

Figures of the ♂ genitalia (armature) have been given of all the species possible in the genera, *Colletes*, *Prosopeis*, *Halictus*, &c. In *Andrena*, however, the characters presented by these organs are not nearly so strongly pronounced as in the allied genera, and I have therefore not thought it worth while to figure them, except in such instances where there is some striking divergence from the ordinary type.

The number of species in the *Diploptera* exceeds by three that given by Mr. F. Smith in his 1871 Catalogue, published by this Society; whereas the *Anthophila*, to the

end of the *Andrenidæ*, show a decrease in the numbers, of twelve, since 1876, the date of publication of the 2nd edition of his British Museum Catalogue of British Hymenoptera.

The increase of three in the *Diploptera* is caused by the discovery of that number of additional species to our list. The decrease of twelve in the *Anthophila* is accounted for thus: eleven new species have been added to the list, and twenty-three of those given by F. Smith have been rejected for the following reasons: three as being of doubtful British origin, viz., *Prosopis variegata*, *P. bifasciata*, and *Halictus interruptus*; five as being stylopised forms of well known species of *Andrena*; three as being autumn broods of species which also occur in the spring; two as being males of already described females, and which had not before been properly mated; and the remaining ten as being mere forms or races which I have not thought important enough to retain as distinct species.

My thanks are due to a great many who have helped me very much in the loan of specimens, and in other ways; and I have especially to thank Professor Perez, of Bordeaux, and Mr. C. Ritsema, of Leyden, for much valuable assistance that they have given me in comparing our British specimens with those in their collections. I must also thank the Rev. E. N. Bloomfield and Rev. W. Farren White; also Messrs. Billups, Bridgman, E. P. and F. Collett, C. W. Dale, E. Parfitt, V. Perkins, and R. Service for many specimens which they have given me, and for valuable communications as to localities, &c.

HYMENOPTERA.

ACULEATA.

Hairs simple, or in some cases twisted, but not branched or plumose	Section 1.
Hairs more or less branched or plumose, at least those on the thorax	Section 2.

SECTION I.

1. Wings not folded longitudinally ..	<i>Heterogyna—Fossores.</i>
2. Wings (at rest) folded longitudinally	<i>Diploptera.</i>

DIPLOPTERA.

- (2) 1. Abdomen petiolated; 1st joint much narrower than
2nd *Eumenes.*
(1) 2. Abdomen not petiolated; 1st joint not much narrower
than 2nd.
(4) 3. Intermediate tibiæ with one spine only at the apex .. *Odynerus.*
(3) 4. Intermediate tibiæ with two spines at the apex .. *Vespa.*

VESPA, *Linn.*

Linn., *Syst. Nat.*, ed. x., p. 572.

This is the only genus of the social wasps that we have in this country, and can scarcely be confounded with any other. The communities are composed of ♂, ♀ and ♀, and form their nests in the ground or in trees or bushes. The ♀ hibernates in an impregnated condition, and the new brood appears about August. All our species are ornamented with bright yellow markings. Labial palpi 4-jointed; maxillary 6-jointed. Wings with three submarginal cells.

- (2) 1. Thorax with brown and red markings *crabro.*
(1) 2. Thorax with black and yellow markings.
(10) 3. Eyes touching, or almost touching, the base of the
mandibles.
(9) 4. Markings of the body all black and clearly defined.
(8) 5. Basal joint of antennæ black in the ♀ and ♂.
(7) 6. ♀; 1st segment of body with a continuous black
band at the base. ♂; clypeus with a black
central line generally widened in front. ♂ more
pubescent *vulgaris.*
(6) 7. ♀; 1st segment with three basal spots, the central
one largest. ♂; clypeus usually with only three
black dots. ♂ less pubescent *germanica.*
(5) 8. Basal joint of antennæ yellow in front in ♀ and ♂;
♂ unknown *arborea.*
(4) 9. Markings of body, especially near the base, more
or less undefined, fading off into markings of a
brownish or reddish hue *rufa.*
(3) 10. Eyes not nearly touching the base of the man-
dibles.
(12) 11. Larger; no reddish colour on the body *sylvestris.*
(11) 12. Smaller; sides of the body at the base more or less
reddish *norvegica.*

1. *Vespa crabro*, Linn.

Linn., Syst. Nat., ed. x., vol. i., p. 572; Fig. Smith, Brit. Foss. Hym., &c., p. 221; pl. v., fig. 10.

Red-brown; sides of the mesothorax and a line down the middle darker; mandibles, except the black apical margin, clypeus, face, scape of the antennæ beneath, head behind the eyes, apex of the 1st abdominal segment narrowly and regularly, apex of the 2nd widely and irregularly, and the whole of the remaining segments, except two or three spots at the base, yellow; beneath yellow; each segment with two or three brown spots; surface hairy, more densely so in the ♂, in which sex the antennæ are considerably longer than the thorax, and the joints beneath sinuate. Head and thorax punctured. Wings yellowish brown, Abdomen rather remotely punctured. Legs with projecting hairs, and covered with a fine, very short, silky pubescence; front femora in the male densely fringed beneath. Length, ♂ 23—25 mm., ♀ 25—30 mm., ♂ 18—23 mm.

Hab. This insect (our common hornet) is common in many places, and makes its nest in decayed trees or out-houses. F. Smith says that it has been found also in a bank.

2. *Vespa vulgaris*, Linn.

Linn., Syst. Nat., ed. x., vol. i., p. 572; Panz., Faun. Germ., 49, 19; Fig. Smith, Brit. Foss. Hym., &c., p. 215; pl. v., figs. 13, 14, 15, 16, 17, 20.

Head finely punctured, covered with long black hairs. Eyes almost touching the mandibles, which are yellow, except at the apical margin. Clypeus yellow, with a black stripe down the middle, widening at the apex; in the ♂ this stripe is often reduced to a spot. Face above the clypeus black, with a yellow spot on each side, in the sinus of the eyes, and a transverse trapezoidal spot between the antennæ. Antennæ in the ♂ with a yellow spot on the scape. Thorax hairy, and finely punctured like the head, with a line on each side from the tegulæ to the anterior margin; a spot below the tegulæ, a spot on each side of the scutellum, two spots on the post-scutellum, and two on the metathorax, yellow. Abdomen clothed with short pale hairs, yellow, with a black band at the base of each segment, the bands slightly

and angularly produced in the centre, and with a round black spot at each side of the angle; on the 2nd and following segments in many varieties the black colour is extended, so that the central angle and the black spots at its sides are united. This is generally the case in the ♂; each segment beneath with a narrow black basal band, produced at each side into a spot, or with an unconnected spot below it; sometimes also the centres of the bands are angularly produced. Genital segments of the ♂ with the sagittæ rounded at the apex, and not emarginate. Legs yellow; the femora, except at the apex, and sometimes the tibiæ inwardly, black. Length, ♂ 17 mm., ♀ 18—20 mm., ♂ 12—15 mm.

Hab. Common everywhere. The ♀ hibernates, and may often be found in the early spring; the ♂ appears most abundantly in August. Makes its nest in the ground.

3. *Vespa germanica*, Fab.

Fab., Ent. Syst. ii., p. 256; Panz., Faun. Germ., 49, 20; Fig. Smith, Brit. Foss. Hym., &c., p. 216; pl. v., figs. 18, 19, 21.

Very like the preceding, and sometimes very difficult to separate from it.

The ♂ may, however, be easily known by the very different shape of the genital organs, the sagittæ being sharply emarginate instead of rounded at the apex; the black colour also of the truncate portion of the basal segment of the abdomen does not extend on to the dorsal surface, except just in the middle and at each side, where it forms a triangular spot; the other segments of the abdomen have each a triangular spot in the middle and a small round spot on each side.

The ♀ may be known from that of *vulgaris* by the three distinct black spots on the clypeus, and by the coloration of the basal segment of the abdomen, which has, instead of the angulated band of *vulgaris*, a black diamond-shaped spot in the centre extending almost from the base of the dorsal surface to the apex, and a small, somewhat square, black spot on each side of it; the 2nd and following segments vary in the extent of the black colour, but have generally a narrow black central spot at the base, sometimes springing from a basal band, and a

round spot on each side of the central one about midway between the base and apex.

The ♀ is very difficult to separate from some varieties of *vulgaris* ♀, as the basal band of the 1st abdominal segment in the latter is occasionally broken into three spots; but when this is the case the three separate black spots on the clypeus of *germanica* will serve to distinguish it. Length, ♂ 17 mm., ♀ 18—20 mm., ♀ 12—15 mm.

Hab. Equally common with the preceding.

4. *Vespa rufa*, Linn.

Linn., *Syst. Nat.*, ed. x., vol. i., p. 572; Smith, *Brit. Foss. Hym.*, &c., p. 217; Fig. Curtis, *Brit. Ent.*, pl. 760.

This species, allied to *vulgaris* and *germanica* in the structure of the head, may be separated from them at once in all the sexes by the indefinite markings of the abdomen; these markings do not stand out clearly black against the yellow, but on the 1st and 2nd segments, and sometimes on the others, they are irregularly bordered with brownish red. The face is very like that of *vulgaris*, but the spaces in the sinuation of the eyes are not entirely yellow, as in that species, but have only a narrow yellow line near the apex of each. There is a good structural character pointed out by Thomson, *viz.*, that the sides of the head posteriorly are not margined in this species, as they are in *vulgaris* and *germanica*; this character, however, is difficult to see without removing the head.

The ♂ may be easily known structurally by the shape of the genital organs, the sagittæ of which are produced into a process somewhat resembling the shape of a duck's bill. Length as in the preceding.

Hab. Common and generally distributed, but not so abundant as either of the preceding.

The extent of the red colouring of the abdomen varies very much, especially in the ♀, which has sometimes, according to Smith, the first two abdominal segments entirely red.

5. *Vespa arborea*, Smith.

Smith, Zool. i., p. 170, 6, fig. 1, ♀; Brit. Foss. Hym., &c., p. 218, pl. v., figs. 11, 12.

I have only seen a very few ♀ of this species, but they certainly appear to be distinct from any other ♀ that I know; the 1st segment of the abdomen is longer, and the legs decidedly thicker and more hairy; otherwise it is like a *rufa* without the rufous edges to the black markings, with the scape of the antennæ yellow in front, and the clypeus with three black spots.

6. *Vespa sylvestris*, Scop.

Scop., Ent. Carn., p. 309; Smith, Brit. Foss. Hym., &c., p. 219.

The distinctive characters of this and the following species, by which they may be known from any of the preceding, is the long space between the eye and the base of each mandible. The scape also is yellow in front in all the sexes.

♂ marked much as in *vulgaris* ♂, but with the abdomen rather less elongate, and the genital segments much smaller in proportion; the sagittæ wide throughout, and not dilated at the apex; laciniaë each with a curved spine. Apical segment of the abdomen entire.

♀ and ♂ with more regular black basal bands to the abdomen than in *vulgaris*, and with the surface more shining. Clypeus with only a single small central spot. Length, ♂ 15 mm., ♀ 18 mm., ♂ 15 mm.

Hab. Generally distributed and common in many places. Makes its nest generally in trees.

7. *Vespa norvegica*, Fab.

Fab., Species Ins., p. 460; Smith, Brit. Foss. Hym., &c., p. 220.

Smaller and shorter than the preceding, but similar to it in the shape of the head; it may be distinguished from it structurally in having the clypeus only remotely punctured, whereas in *sylvestris* its puncturation is close. In coloration it differs considerably, having a wide central black stripe down the clypeus dilated at the apex, much

as in *V. vulgaris*, and in having the sides of the 2nd abdominal segment, and sometimes of the 1st, more or less red; this red colour is not always present, but in the ♂ is often very bright, and sometimes nearly covers the 1st and 2nd segments. Length, ♂ 14 mm., ♀ 18 mm., ♂ 12—13 mm.

Hab. North of England, Scotland, near Norwich, Devonshire, &c.

ODYNERUS, *Latr.*

Latr., *Hist. Nat.*, vol. xiii., p. 346.

This genus is so well marked that I need not make many observations on its value. In colouring its species resemble *Eumenes*, but the wide basal segment of the abdomen will distinguish them at once: from *Vespa*, the only other genus of the *Diptera*, the smaller and more elongate form and the scarcity of the yellow markings will serve at a glance to separate them, while the absence of the second spine at the apex of the intermediate tibiae is an excellent structural distinction. All the species are black, with yellow apical bands to the abdominal segments, and there is such a general resemblance between them that I have only pointed out their distinguishing characters.

The three sections pointed out by Wesmael are natural, and have been generally recognised; these I have given in the table of species. There is now a 4th division, *Leionotus*, Sauss., but we have no English representative of it; several, however, occur in Sweden, and I have a single specimen, without locality and without indication of its captor, which belongs to this section. Without, however, further proof of its being British, I refrain from describing it. Still, I hope that some day further captures may make it possible to add the species to our list.

One of the peculiarities of the species of this genus is the transverse costate impression which traverses the 2nd abdominal segment beneath, near the base, and on this peculiarity Thomson has formed some excellent specific characters.

- (2) 1. 1st segment of the body without a transverse raised line at the base; antennæ in ♂ spirally rolled at the apex Subgenus 1. *Hoplopus*.
- (1) 2. 1st segment of the body with a transverse raised line at the base; antennæ in ♂ sometimes simple, sometimes reflexed and hooked at the apex.
- (4) 3. Apical joint of the antennæ sharply recurved; 1st segment of the body in both sexes covered with long hairs Subgenus 2. *Ancistrocerus*.
- (3) 4. Antennæ in the ♂ simple; 1st segment of the body without long hairs Subgenus 3. *Symmorphus*.

Subgenus I. HOPLOPUS.

- (2) 1. Abdomen red at the base *basalis*.
- (1) 2. Abdomen not red at the base.
- (4) 3. ♂ with a long yellow spine on the intermediate coxæ; ♀ with a yellow spot on the clypeus *reniformis*.
- (3) 4. ♂ with the coxæ simple; ♀ with clypeus black.
- (6) 5. Femora of ♂ simple; thorax in both sexes truncate in front; its angles prominent *levipes*.
- (5) 6. Intermediate femora of ♂ dentate; thorax not truncate anteriorly in either sex; its angles not prominent.
- (8) 7. Larger; markings yellow; pubescence of head and thorax denser and dark *spinipes*.
- (7) 8. Smaller; markings nearly white; pubescence of head and thorax pale *melanocephalus*.

1. *Odynerus spinipes*, Linn.

Linn., Syst. Nat., ed. x., vol. i., p. 573; Smith, Brit. Foss. Hym., &c., p. 203, pl. v., figs, 7, 8.

♂. Black, with the clypeus, mandibles, antennæ in front, a line between them, the prothorax in front, a narrow band at the apex of each abdominal segment except the last, more or less abbreviated on the 3rd, 4th, 5th, and 6th, yellow. Legs yellow, with the femora at the base, and the tibiæ inwardly, more or less black; ♀ similarly coloured, but with the antennæ and clypeus entirely black, and the yellow abdominal bands almost entire throughout.

Head and thorax rugosely punctured, covered with greyish black hairs. Clypeus very deeply emarginate in the ♂, slightly so in the ♀. Antennæ flattened towards the apex, and spirally curved in the ♂, somewhat clavate in the ♀; prothorax slightly rounded in front, its angles right angles, but scarcely prominent. Mesothorax about as

long as wide. Wings with their margins and the externo-medial cell more or less smoky brown; nervures dark brown. Abdomen with the basal segment rugose, and covered with black upright hairs, the following segments finely punctured; intermediate femora of the ♂ largely tridentate, the basal tooth the longest and narrowest, and rather pointing outwards, *i. e.*, away from the body; the central tooth somewhat truncate, the apical somewhat rounded on its external margin, and pointing towards the body. Length 13—14 mm.

Hab. Common in many places; its burrows, which are formed in banks, have curved, tubular entrances, composed of pieces of mud, &c., joined together.

2. *Odynerus melanocephalus*, Gmel.

Gmel., Syst. Nat., i., pt. v., p. 2760; Smith, Brit. Foss. Hym., &c., p. 205.

Very like *spinipes*, but smaller, and with the abdominal bands white or pale cream-coloured instead of yellow, the second band wider and more dilated at the sides; the pubescence of the head and thorax is less abundant, finer and pale, the tegulæ testaceous. The ♂ may be further distinguished by the shape of the intermediate femora, the central tooth being pointed instead of widely truncate; and in having a small tubercle in the centre of the 2nd abdominal segment beneath; the whole of the under surface of the segment is far less polished than in *spinipes*. The ♀ may be further known by the almost truncate clypeus, and the pale antennæ beneath. Length 9—10 mm.

Hab. Not common; Isle of Wight, Bristol, Deal, Hastings, Norwich, &c.

3. *Odynerus levipes*, Shuck.

Shuck., Loud. Mag. Nat. Hist., n. s. i., p. 490; Smith, Brit. Foss. Hym., &c., p. 204.

The ♂ of this species may be known at once from either of the preceding by its simple intermediate femora, and by the larger and squarer vertex of its head, and its prominent prothoracic angles. The ♀, which rather closely resembles that of *melanocephalus*, may be known from it by its larger squarer vertex, its deeply emarginate

clypeus, its more truncate prothorax, with its more prominent lateral angles and narrower pale stripes; its dark tegulæ, sometimes with a citron spot posteriorly, and the linear pale band of the 2nd abdominal segment. Length 10 mm.

Hab. Rare. Hampstead; Bristol. Burrows in dead bramble stems, from which it may be bred.

4. *Odynerus reniformis*, Gmel.

Gmel., Syst. Nat., i., pt. v., p. 2750. Fig. Herr-Schäff., Faun. Germ. 173, 17 (*coxalis*).

The characteristic features of this species are the yellow tegulæ, post-scutellum, and lateral metathoracic spots in both sexes, the long yellow spines on the intermediate coxæ of the ♂, and the yellow basal transverse spot on the clypeus, and the wide abdominal bands of the ♀. Length 12—13 mm.

Hab. Chobham, Surrey.

Of this very distinct species only one ♂ has occurred, which I took myself at Chobham in June, 1876. I have collected frequently in the same neighbourhood since, but have never met with it again. Its yellow post-scutellum and tegulæ would distinguish it, even in the net, from its allies.

5. *Odynerus basalis*, Smith.

Smith, Cat. Hym. Brit. Mus., pt. v., *Vespidæ*, p. 58; Fig. Ent. Annual, 1869, fig. 1, front. fig.

Black; basal segment of the abdomen with a large red spot on each side in the ♂; almost entirely red in the ♀; ♂ with only the last two joints of the antennæ recurved.

♂ coarsely punctured; a spot between the antennæ, the clypeus, the scape beneath, a line in the lower part of the sinus of the eye and a small spot behind each eye, the prothorax in front, the tegulæ, a double spot at the apex of the scutellum, and an apical band to the first five abdominal segments, pale yellow; the 2nd abdominal band slightly widened at the sides; flagellum beneath, 1st segment of the abdomen at the sides and beneath, and all the legs, reddish testaceous. Wings dusky. Clypeus rather deeply emarginate at the apex. Legs simple.

♀ differs from the ♂ in having the clypeus black, and sometimes with a transverse yellow band at the base, in having the posterior margin of the post-scutellum, as well as that of the scutellum, yellow, and in having the red of the basal segment more extended; the apical bands of the abdominal segments are also wider, and the whole insect rather more robust. Length 12—13 mm.

Very rare. ♀ Stowborough Heath (Rothney); ♂ Isle of Portland (C. W. Dale).

Subgenus II. ANCISTROCERUS.

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| (2) | 1. | 2nd segment of body beneath slightly raised towards the base, then falling abruptly to the level of the transverse crenate sulcature .. | <i>callosus.</i> |
| (1) | 2. | 2nd segment of body beneath not raised towards the base, and not abruptly truncate above the basal sulcature. | |
| (4) | 3. | 2nd segment of body beneath not longitudinally convex; costæ of basal sulcature short .. | <i>parietum.</i> |
| (3) | 4. | 2nd segment of body beneath more or less convex longitudinally; costæ of basal sulcature long. | |
| (6) | 5. | Concavity of metathorax, above the insertion of the body, somewhat shining | <i>Antilope.</i> |
| (5) | 6. | Concavity of metathorax quite dull. | |
| (8) | 7. | Mesothorax, between the tegulæ, longer than wide | <i>trifasciatus.</i> |
| (7) | 8. | Mesothorax, between the tegulæ, not so long as wide. | |
| (10) | 9. | Body with only three yellow bands | <i>trimarginatus.</i> |
| (9) | 10. | Body with many yellow bands. | |
| (12) | 11. | Basal segment of body wide; its apical band in the ♀ linear throughout | <i>pictus.</i> |
| (11) | 12. | Basal segment of body narrow; its apical band in the ♀ largely and suddenly dilated at the sides .. | <i>parietinus.</i> |

6. *Odynerus callosus*, Thoms.

Thoms. Opusc. Ent. i., p. 87; Hym. Eur., pt. 3, p. 61; = *quadratus*, Smith, Brit. Foss. Hym., &c., p. 207 (nec Panz.?).

Black; mandibles, clypeus, entirely in the ♂ and sometimes with two spots in the ♀, scape of the antennæ in front and a spot between the antennæ in both sexes, and a spot on each side of the prothorax, two small spots on the tegulæ, and sometimes a spot below the wings, two spots on the scutellum, a wide apical band on each abdominal segment, the basal one widely and squarely

notched in the middle, the tibiæ and tarsi, yellow; the apices of the tibiæ inwardly black in the ♀: these markings are very subject to variation.

The character by which this species may be at once distinguished is the form of the 2nd abdominal segment beneath; this, as in all the other species, has a transverse sulcature situated at a little distance from its base, traversed by numerous longitudinal costæ; from the level of these costæ the surface of the segment on the side towards the apex rises suddenly at right angles to the costæ, the ventral surface again being at right angles, so that the ventral surface and costæ are parallel to each other on different levels. This character is easily visible if the insects be looked at sideways, and appears to be always well maintained. Length 9—13 mm.

A very common species, but generally confounded with the following.

The shape of the basal band *alone* is valueless, as the same shape occurs in *parictinus*, and sometimes in *parietum*.

7. *Odynerus parietum*, Linn.

Linn., Syst. Nat., ed. x., vol. i., p. 572; Smith, Brit. Foss. Hym., &c., p. 206.

Very like the preceding, but rather more robust, and so variable in coloration that no dependence can be placed on that character; the basal band of the abdomen, however, as a rule, is angularly, not squarely, notched in the centre. The form of the 2nd abdominal segment beneath will separate it at once from its allies; the ventral surface of the body, on the side of the costate sulcature towards the apex, at its point of juncture with it, is actually below the level of the costæ instead of rising up angularly to a higher level; the ventral surface is quite flat *longitudinally*, not convex as in all the following species. Length 8—14 mm.

Hab. Very common.

8. *Odynerus pictus*, Curt.

Curt., Brit. Ent. iii. 138; Smith, Brit. Foss. Hym., &c., p. 209.

This species differs from either of the preceding considerably in colour, although some dark males of *parietum*

might be confounded with it. The thorax is generally entirely black, with the exception of a narrow line on the prothorax, and two spots on the tegulæ of the ♀; the bands of the abdomen are all linear throughout and narrow; there is one on each of the first five segments, and a spot on the apex of the 6th in the ♀; the tibiæ and tarsi are pale, more or less tinged with red. The 2nd segment of the abdomen beneath is convex longitudinally beyond the costate sulcature, and its ventral surface thereby considerably above the level of the costæ. The basal segment of the abdomen also is unusually broad in this species. Length 10—13 mm.

Hab. Not common. Wandsworth; Bristol; Portland; Isle of Wight; Weybridge.

Very like the following, but distinguishable, as pointed out under its description.

9. *Odynerus trimarginatus*, Zett.

Zett., *Ins. Lapp.*, p. 456; Smith, *Brit. Foss. Hym.*, &c., p. 209.

Very like *pictus*, but differing in having only three abdominal bands, and the basal segment of the abdomen narrower in proportion to its length. Length 10—13 mm.

Hab. Widely distributed. Walmer and Kingsdown, Kent; Lowestoft; Littlehampton; Hayling Island; Loch Rannoch, Perthshire.

10. *Odynerus trifasciatus*, Oliv.

Oliv., *Enc. Meth.* vi., p. 688; Smith, *Brit. Foss. Hym.*, &c., p. 208.

Very like *parietum* and *parietinus* in colour, but more elongate, the thorax being decidedly longer than in any other species of the section; the tibiæ are widely black at the apex inwardly, and narrowly fuscous at the base in the ♀, black in the ♂; the abdomen has three yellow bands, and sometimes an indication of a 4th; the basal band generally dilated at the sides. Length 8—12 mm.

Hab. London district, &c.

Easily recognised by its elongate shape.

11. *Odynerus antilope*, Panz.

Panz., Faun. Germ. 53, 9; Smith, Brit. Foss. Hym., &c., p. 210.

Larger than any of the preceding species, and distinguishable from either *trimarginatus* or *trifasciatus* in having a yellow band on each of the first four segments in the ♀, and of the first six in the ♂; from *pictus* it differs in having a narrower basal segment to the abdomen, with a wider, usually trisinate, apical band, and in having the tibiæ black at the apex inwardly.

The chief characteristics of the species are its large size and shining metathoracic concavity. Length 14—18 mm.

Hab. Not common near London. F. Smith says "abundant in Yorkshire"; it has also been taken at Lynn, Norfolk.

12. *Odynerus parietinus*, Linn.

Linn., Faun. Suec., ed. ii., p. 418; Fig. Curt., Brit. Ent. iii., 137.

Very like *callosus* in the shape of the basal band of the ♀, but almost as large as *antilope*. All the segments have apical bands. It may be known from either *parietum* or *callosus* by the shape of the 2nd ventral segment; from *pictus* by the narrow basal segment; and from *antilope* by the dull metathoracic concavity. Length 12—16 mm.

Hab. Chobham; Norwich; Dorsetshire; Charlwood, Surrey, &c. Probably common, but mixed with *parietum* or *callosus*.

Subgenus III. SYMMORPHUS.

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|--------|---|-----------------------|
| (2) 1. | Larger; sides of mesothorax shining and almost impunctate | <i>crassicornis</i> . |
| (1) 2. | Smaller; sides of mesothorax punctured. | |
| (4) 3. | Three abdominal bands only; anterior angles of the thorax not mucronate | <i>sinuatus</i> . |
| (3) 4. | Many abdominal bands; anterior angles of thorax mucronate | <i>gracilis</i> . |

13. *Odynerus crassicornis*, Panz.

Panz., Faun. Germ. 53, 8; Smith, Brit. Foss. Hym., &c., p. 200, pl. v., fig. 4.

Black; shining, with a very short brownish grey pubescence on the head and thorax. Mandibles and clypeus in the ♂, a spot only on the clypeus in the ♀, the scape of the antennæ beneath in both sexes, a spot on each side of the prothorax, the tegulæ and a spot under the wings, two spots on the scutellum, and a wide sinuous band on each abdominal segment, ferruginous-yellow; femora black, their apices and the tibiæ and tarsi ferruginous. Head and thorax rugosely but shallowly punctured. Scutellum and basal segment of the abdomen very largely punctured; the remaining segments more finely so. Metathorax very rugose. Wings dusky; basal segment of the abdomen campanulate, with a rugose central impression; 2nd segment considerably wider than the 1st. Length 12—14 mm.

Hab. Rare. Darent, &c. I have specimens from Shuckard's collection without note of locality.

14. *Odynerus gracilis*, Brullé.

Brullé, Exp. Mor. Ins. iii., pl. 1, f. 3; Smith, Brit. Foss. Hym., &c., p. 202 = *elegans*, Wesm.

Much smaller than the preceding, and with bright pale yellow markings; ♂ with five and ♀ with four abdominal bands; prothorax sharply truncate in front, its angles produced and acute; mesothorax below the wings punctured, and with a yellow spot, surrounded by a crenate impression; tibiæ with a black spot near the apex inwardly. Length 8—11 mm.

Hab. Common in many places.

15. *Odynerus sinuatus*, Fab.

Fab., Ent. Syst. ii., p. 270; Smith, Brit. Foss. Hym., &c., p. 201 = *bifasciatus*, Wesm.

Very like *gracilis*, but differing in the absence of the band on the 3rd abdominal segment, in the more rounded front margin of the prothorax and the less prominent angles, and in the want of the crenate impression on the mesothorax below the wings.

Hab. Generally distributed.

EUMENES, *Latr.*

Latr., *Hist. Nat.* xiii. 360.

Like *Odynerus* in coloration, but at once distinguishable by the narrow 1st segment of the abdomen, which is not nearly half as wide as the following one. Antennæ of the ♂ terminating in a hook.

1. *Eumenes coarctata*, Linn.

Linn., *Syst. Nat.*, ed. x., vol. i., p. 573 ; Smith, *Brit. Foss. Hym.*, &c., p. 197, pl. v., fig. 2.

Black ; rugosely punctured ; head and thorax and 1st abdominal segment covered with short brownish hairs. Clypeus entirely in the ♂, with only a spot at the base in the ♀, prothorax with a line in front, tegulæ, post-scutellum, a spot under each wing and on each side of the metathorax (occasionally), a band at the apex of the first four abdominal segments, a spot on each side of the 2nd segment and sometimes also of the 1st, yellow. Femora black, their apices and the tibiæ and tarsi yellow. Wings brown along the region of the externo-medial cell. Head, thorax, scutellum, and 1st abdominal segment closely and rugosely punctured ; the last narrowly petiolated at its base, and campanulate, with a slight longitudinal central channel, its apical margin smooth, raised, and yellow ; 2nd and following segments punctured, but much less rugosely so than the first, and more or less shining, covered with a short pubescence. Length 13—15 mm.

Hab. Local. Chobham ; Blackwater, and Parley Heath, Hants ; Sandhurst, Berks ; Sunning Hill ; Weybridge.

Section II.

Hairs of body more or less plumose or branched.

- | | | | | | | | |
|--|----|----|----|----|----|----|-----------------------|
| 1. Tongue obtuse, emarginate at the apex.. | .. | .. | .. | .. | .. | .. | <i>Obtusilingues.</i> |
| 2. Tongue acute | .. | .. | .. | .. | .. | .. | <i>Acutilingues.</i> |

OBTUSILINGUES.

- | | | | |
|---|----|----|------------------|
| (2) 1. Three submarginal cells ; thorax densely hairy | .. | .. | <i>Colletes.</i> |
| (1) 2. Two submarginal cells ; thorax almost naked | .. | .. | <i>Prosopis.</i> |

COLLETES, *Latr.*

Latr., *Hist. Nat.* iii., p. 372. For figures of generic characters see *F. Smith, Catal. Brit. Hym.*, 2nd ed., pl. vi.

Tongue short, bifid; labial palpi 4-jointed; maxillary 6-jointed; anterior wings with three submarginal cells.

The species in this genus of obtuse-tongued bees bear a very close resemblance to each other; they have all more or less pale apical bands to the abdominal segments, and have the head and thorax densely hairy. The hairs, when examined under a microscope, are amongst the most beautifully branched of any of the *Mellifera*.

- (10) 1. Small species, 8—10 mm. Abdomen with distinct apical bands to the segments.
- (9) 2. 1st segment of the abdomen closely punctured.
- (4) 3. ♂ with the 6th segment beneath deeply foveated on each side; the foveæ small and well defined. ♀ with the surface of the abdomen shining; 1st segment somewhat finely punctured; the segments testaceous at the apex *succincta*.
- (3) 4. ♂ with the 6th segment beneath more or less largely impressed at the sides, or simple. ♀ with the 1st segment dull and coarsely punctured, or with the apices of the segments black.
- (8) 5. ♂ with the 6th segment beneath impressed on each side and subfoveated. ♀ with the hairs of the thorax bright brown; the abdomen scarcely shining.
- (7) 6. ♂ with the 6th segment shining beneath, not deeply punctured; the other segments beneath depressed and shining, fringed only at the sides. ♀ with the abdomen dull; 1st segment clothed on its basal half with long pale hairs *jodiens*.
- (6) 7. ♂ with the 6th segment beneath less shining, strongly and largely punctured; the apical fringes of the other segments complete. ♀ with the abdomen less dull than in No. 6; 1st segment naked, except at the extreme base *picistigma*.
- (5) 8. ♂ with the 6th segment beneath simple. ♀ with the hairs of the thorax dull greyish brown. Abdomen somewhat shining *marginata*.
- (2) 9. 1st segment of the abdomen finely and remotely punctured *Daviesana*.
- (1) 10. Large species, 14—15 mm. Abdomen with only very indistinct apical bands to the segments .. *cunicularia*.

1. *Colletes succincta*, Linn.

Linn., Syst. Nat., ed. x., vol. i., p. 576; Smith, Cat. Brit. Hym., 2nd ed., p. 3.

Head and thorax clothed with pale brownish hairs, paler under the wings and underneath the head. Abdomen black; ♂ with a pale ochreous band at the apex of each of the first six segments; ♀ with the apex of each segment narrowly testaceous, and with a narrow whitish band. Legs with pale hairs.

♂. Subelongate; head finely punctured. Antennæ with the basal joint covered with long hairs; each joint of the flagellum distinctly longer than wide; mesothorax and scutellum largely and deeply punctured; metathorax rugose. Abdomen closely punctured, coarsely on the basal segment, finely on the rest; the basal segment also clothed with long pale hairs, especially at its base. Beneath rather shining and punctured, the segments not depressed, the pubescent bands at the apex of each entire; the 5th segment slightly emarginate; the 6th with a small deep transverse fovea on each side. Tarsi with the joints considerably longer than wide, clothed with a few long hairs and pale spines round the apex of each joint. Genitalia with the stipites stout, and bearing a narrow hairy appendage at the apex. Sagittæ wide at the base and converging to the apex, with a narrow membranous wing-like appendage near the apex; (see pl. vii., fig. 14).

♀. Larger and more robust than the ♂. Head and thorax clothed much the same as in that sex, but the clypeus less densely; cheeks between the eyes and the mandibles slightly longer than in the following species. Abdomen more or less shining; basal segment finely and closely punctured; the 2nd and following still more finely; each segment bears at the apex a narrow band of whitish hairs, and the basal segment is clothed with long pale hairs at the base. Length 9—11 mm.

Hab. Generally distributed and often common.

2. *Colletes fodiens*, Kirb.

Kirb., Mon. Ap. Angl. ii., p. 34, pl. xv., fig. 1; Smith, Cat. Brit. Hym., 2nd ed., p. 4.

Very like the preceding, but differs in having the antennæ of the ♂ shorter; the 6th ventral segment of the

abdomen without a deep fovea on each side, but with a slight wide depression; all the segments beneath very shining and flat, each with the apical half slightly impressed; the pubescent bands interrupted in the centre; genitalia with the sagittæ narrow and winged nearly throughout their length; the stipites much narrower than in *succincta*, and longer in proportion to the length of the sagittæ (see pl. vii., fig. 1). Tarsi with the joints much wider than in *succincta*, nearly as wide as long; the legs altogether much more hairy than in that species.

The ♀ differs from *succincta* in the more brightly-coloured hairs of the thorax, in the dull, much more rugosely punctured, abdomen, the concolorous margins of the segments (although the basal segment is sometimes narrowly testaceous at the apex), the wider and more ochreous coloured abdominal bands, and the shorter cheeks between the eyes and the mandibles, the clypeus more densely clothed with hairs and slightly emarginate. Length 9—10 mm.

Hab. Sandy commons, &c.; generally common.

3. *Colletes picistigma*, Thoms.

Thoms., Hym. Scand. ii., p. 165 = *marginata*, Schenk, nec Smith.

So like the two preceding that it is only necessary to point out its distinguishing characters.

The ♂ may be known from that of *succincta* by the shorter antennæ, the absence of the small deep foveæ in the 6th ventral segment, and the different genitalia, as shown in pl. vii., fig. 3; from *fodiens* by having the segments of the body beneath with complete apical fasciæ, their surface less shining, and not quite so flat, the 6th segment beneath largely punctured, with a large shallow marginal depression on each side near the apex, leaving the disk raised, and by the very different genitalia.

♀ differs from *succincta* in having the dull close puncturation of *fodiens*, and the concolorous margins of the segments; from *fodiens* it differs in the deeper black colour of the abdomen, and in its slightly wider and shorter form, in the absence of long pale hairs on

the basal half of the 1st segment, and in the white colour of the apical bands. Length 9—10 mm.

Hab. Southwold, Hastings, Hampshire, Littlehampton, Hayling Island, Norwich, &c. I expect that this is a common species, but overlooked.

4. *Colletes marginata*, Smith.

Smith, Zool. iv. 1277; Cat. Brit. Hym., 2nd ed., p. 4 = *balteata*, Nyl., Thoms., &c.

Smaller than any of the preceding, but similar in general appearance.

The ♂ may be known from all its allies by the simple 6th ventral segment, which is not foveated at the sides, and has a slightly raised dorsal line; the other segments have the apical bands entire, and the surface punctured and convex. The genitalia are quite different from those of any other species, the sagittæ being produced at each side into a curved wing-like appendage, above which, near the base, projects a strong angular tooth. See pl. vii., fig. 13.

The ♀ is very like the others of the genus, but, besides being smaller, it has the hairs of the thorax of a duller brown colour, the surface of the abdomen slightly shining, and the clypeus and face less hairy; the 1st segment of the abdomen is largely and rugosely punctured, and clothed with scattered pale hairs at the base; the 2nd segment has a wide basal band of pubescence; this is often the case also in *fodiens*, and at the sides in *pictistigma*, but in them the band is made up of short, very thick, somewhat scale-like, hairs, whereas in this species the hairs are of the ordinary type (with short lateral branches). Length 8—9 mm.

Hab. Littlehampton, Isle of Wight, &c. I have several males of this species, but have only seen one British example of the female.

5. *Colletes Daviesana*, Smith.

Smith, Zool. iv. 1278; Cat. Brit. Hym., 2nd ed., p. 5.

Shining, black. Head and thorax somewhat remotely punctured, covered with dull brownish hairs, paler on the face and under the wings; metathorax rugose. Abdomen shining; 1st segment very finely and remotely

punctured in the ♀, less finely but rather remotely in the ♂; the other segments very finely and closely punctured in the ♀, not quite so closely in the ♂; each segment with a narrow greyish brown band at the apex in both sexes; the basal segment in the ♂ covered with very long erect hairs, the others with shorter hairs; the abdomen of the ♀ is also clothed with erect hairs, but they are much shorter than in the ♂; legs covered with greyish hairs. Genitalia of the ♂ with the sagittæ very much produced, forming two concave knife-like blades, quite unlike those of any of the other species. See pl. vii., fig. 15. Length 8—9 mm.

Hab. Common in many places. Hastings, Littlehampton, Charlton, Reigate, &c.

A very distinct species, easily known from the other smaller species by the shining surface of the body and the remote puncturation.

6. *Colletes cunicularia*, Linn.

Linn., Faun. Suec., ed. ii., p. 422; Smith, Cat. Brit. Hym., 2nd ed., p. 6.

♂. Black-brown, densely covered with brown hairs, those of the face and under side paler. Antennæ reaching not quite to the scutellum; head finely rugose; thorax with its surface somewhat shining and largely and remotely punctured; nervures of the wings brown. Abdomen oval, slightly shining, finely and somewhat remotely punctured on the basal segment, more closely on the following; each segment very hairy, with the apical hairs slightly paler than the rest; legs with pale hairs. The genitalia are figured at pl. vii., fig. 2.

♀ broader than the ♂, and the abdomen wider at the base, and more pointed at the apex, its puncturation finer; hairs of the face sooty brown. Antennæ much shorter; legs clothed with pale hairs on the side towards the body, and darker hairs outwardly. The entire insect having much the appearance of an ordinary hive bee. Length 14—15 mm.

Hab. Sand-hills near Liverpool.

A large species which cannot be confounded with any other.

PROSOPIS, *Fab.*

Fab., Syst. Piez., p. 293. For figures of generic characters see *F. Smith*, Cat. Brit. Hym., 2nd ed., pl. vi., and for figures of 7th and 8th ventral segments of all the species see this vol., *antea*, pl. vi.

Tongue short, obtuse, somewhat bifid. Maxillary palpi 6-jointed; labial palpi 4-jointed; anterior wings with two submarginal cells.

A genus of small coal-black bees, with scarcely any pubescence, and with the abdomen generally shining and polished, the tibiæ generally more or less variegated with yellow; the face in the ♂ white, except in one species (*cornuta*), in the ♀ generally with two yellow spots.

- (2) 1. ♂; face black, excavated and shining above the insertion of the antennæ. ♀; face with two short spines *cornuta*.
- (1) 2. ♂; face white. ♀; face simple.
- (6) 3. 1st segment of abdomen with no lateral white pubescence at the apex.
- (5) 4. Scape of antennæ in ♂ flattened, dilated, and white anteriorly. ♀; spots of face nearly round, situated in the middle just below the antennæ *dilatata*.
- (4) 5. Scape of antennæ in ♂ not flattened and dilated. ♀; spots of the face more or less lateral *communis*.
- (3) 6. 1st segment of abdomen at the apex with a narrow line of silvery pubescence at each side.
- (10) 7. Larger species. ♂ with the extreme base only of the 1st joint of the hind tarsi pale; ♀ with the 1st segment of the abdomen largely and somewhat closely punctured.
- (9) 8. Face longer in both sexes. ♂ with the white colour extending high above the insertion of the antennæ at the sides; mandibles with a white line. ♀ with two long narrow spots along the margins of the eyes, extending from above the antennæ almost to the base of the mandibles *punctulatissima*.
- (8) 9. Face shorter in both sexes. ♂ with the white colour not extending above the insertion of the antennæ; mandibles black. ♀ with a white spot on the margin of the eyes, sometimes wanting *signata*.
- (7) 10. Smaller species. ♂ with the whole, or nearly the whole of the basal joints of the posterior and intermediate tarsi yellow. ♀ with the 1st segment of the body very finely or irregularly punctured.
- (16) 11. Scape of the antennæ in the ♂ more or less swollen; spots of the face in the ♀ subtriangular or linear, lateral, and parallel in direction to the inner margins of the eyes.

- (15) 12. Antennæ longer. Scape of ♂ less swollen; face hairy, or mandibles with a pale line. ♀; thorax with two yellow spots on the anterior margin; vertex of head not incrassate.
- (14) 13. Face in ♂ hairy; 1st segment of abdomen shining, very largely and remotely punctured; mandibles black. ♀; flagellum of antennæ pale beneath. . . *hyalinata.*
- (13) 14. ♂; face not hairy; 1st segment of abdomen dull, finely punctured; mandibles and scape of antennæ with a pale yellow line. ♀; flagellum entirely dark *confusa.*
- (12) 15. Antennæ shorter; scape of ♂ very much swollen; face not hairy; mandibles entirely black. ♀; thorax not spotted in front; vertex of head incrassate *brericornis.*
- (11) 16. Scape of antennæ in ♂ not thickened, its sides subparallel; basal segment of abdomen dull, largely and closely punctured. ♀; face round; spots of the face suboval and placed diagonally *pictipes.*

1. *Prosopis cornuta*, Smith.

Smith, Trans. Ent. Soc. Lond. iv., p. 32, pl. iii., figs. 2 and 4; Cat. Brit. Hym., 2nd ed., p. 9; ♂ = *plantaris*, Sm.

Black, shining; face black in both sexes; ♂ with the antennæ, except the scape posteriorly and a line along the back of the flagellum, the anterior tibiæ in front, the base of the tibiæ in the other pairs, and all the tarsi, yellow. ♀ with only the flagellum beneath fulvous, a narrow band at the base of each of the tibiæ, and sometimes two spots on the collar yellow.

Head punctured, ♂ with a shining impression above the insertion of the antennæ; scape much widened and fringed with long pale hairs; when the antennæ are thrown back these widened scapes entirely hide the polished impression, and appear exactly to fit into it; in the ♀ the antennæ are simple, but the clypeus is raised at its base, and has an angular projecting tooth on each side. Thorax dull, closely and finely punctured, scutellum more largely and remotely; metathorax rugose. Abdomen very shining and polished, deeply punctured on the 1st and 2nd segments; tibiæ short, the intermediate pair somewhat dilated; intermediate tarsi with the basal joint in the ♂ produced at its base, in front, into a rounded projection. Genitalia of the ♂ with the stipites truncate at the apex, with very long projecting hairs; 8th ventral segment terminating in two divergent processes, fringed at the apex; 7th produced at the sides

into a wing-like appendage. See pl. vii., fig. 4. Length 6—7 mm.

Hab. Very rare. Reigate; Hastings; Cove Common, Hants, &c.

The black face of the ♂, with its pilose scape and the extraordinary genitalia, and the spinose face of the ♀, distinguish this species from all the others of the genus.

2. *Prosopis dilatata*, Kirby.

Kirby, Mon. Ap. Angl., vol. ii., p. 39; Smith, Cat. Brit. Hym., 2nd ed., p. 8; Fig. Smith, Trans. Ent. Soc. Lond., iv., pl. iii., fig. 1.

Black; ♂ with the face below the antennæ, the dilated portion of the scape in front, the flagellum, except a line at the back, yellow; ♀ with the antennæ fulvous beneath, and a round yellow spot just under the insertion of each antenna; tegulæ and tubercles in both sexes, apices of the femora, and the whole of the tibiæ and tarsi in the ♂, and the base of the tibiæ in the ♀, yellow.

Head and thorax dull, deeply and closely punctured. Antennæ in the ♂ with the scape flattened, deeply punctured, and much dilated, its posterior margin largely rounded at the base, then nearly straight to the apex, the apical margin forming with it a slightly obtuse angle; the anterior margin is largely rounded, especially at its juncture with the apical margin, and then approaches the base in a line convergent with the posterior margin; ♀ with the antennæ simple; the face rounder than in most of the species. Wings slightly dusky. Abdomen dull, and rather largely punctured in the ♂, somewhat shining and finely punctured in the ♀; 2nd segment in the ♂ with an impressed line near the base; tibiæ slightly hairy; ♂ genitalia with the stipites short and simple, but narrowly rounded at the apex; apical hairs short; sagittæ short and somewhat triangular. See pl. vii., fig. 11. Length 5—6 mm.

Rare. Hawley, Hants; Arundel; Hayling Island, on *Hieracium* and *Euphorbia*, &c., both sexes; Hastings.

3. *Prosopis communis*, Nyl.

Nyl., Not. Salls. Faun. Flor. Fenn., Förh. ii., p. 234 ;
Smith, Cat. Brit. Hym., 2nd ed., p. 8 = *annulata*,
Kirby, Förster, &c.

Black ; ♂ with the clypeus down the centre only, or entirely, and the sides of the face, yellow ; the yellow colour of the lateral spots somewhat encircling the antennal cavities at the base ; anterior tibiæ in front, and posterior tibiæ and tarsi narrowly at the base, yellow ; ♀ with a somewhat elongate triangular spot on each side of the face, and a narrow basal ring on the posterior tibiæ, yellow.

Head and thorax deeply punctured, and with a fine scattered pubescence ; the surface between the punctures dull, and seen under a strong power to be finely rugose ; puncturation of the scutellum sparser and larger than that of the mesothorax ; post-scutellum subrugose ; metathorax longitudinally rugose. Wings hyaline. Abdomen shining ; basal segment impunctate or nearly so ; following segments punctured, and in the ♂ with a very short black pubescence ; no white pubescence at the apex of the 1st segment laterally in either sex ; ♂ genitalia with the stipites widely rounded and somewhat dilated at the apex ; sagittæ as long as the stipites or longer, narrow, converging at the apex. See pl. vii., fig. 9. Length 6—7 mm.

Hab. Generally distributed ; generally found in bramble-flowers, and may be bred from the pierced stems.

4. *Prosopis signata*, Panz.

Panz., Faun. Germ. 53, 2 ; Smith, Cat. Brit. Hym., 2nd ed., p. 11.

The largest British species of the genus ; black ; ♂ with the face below the antennæ, ♀ generally with a spot on each side of the face near the eye, both sexes with a spot on each side of the prothorax, and a spot on each tubercle, yellow ; extreme base of the tibiæ and tarsi in the ♂ yellow.

Head and thorax punctured with a fine short pubescence, the puncturation rather closer in the ♂ than in the ♀ ; head across the eyes wider than long ; basal joint of the antennæ in the ♂ slightly curved and thickened at

the apex. Wings hyaline. Metathorax longitudinally rugose. Abdomen in the ♂ dull, strongly punctured, in the ♀ shining, finely punctured; both sexes with a line of white pubescence at the apex of the basal segment, and with a fine greyish pubescence on the sides and towards the apex of the abdomen; legs with fine short silvery hairs; ♂ genitalia with the stipites rounded at the apex; sagittæ shorter, diverging at the apex, and somewhat diagonally truncate. See pl. vii., fig. 7. Length 7—8 mm.

Hab. On flowers of bramble, mignonette, &c., July and August.

5. *Prosopis punctulatissima*, Smith.

Smith, Trans. Ent. Soc. Lond., iv., p. 33; Cat. Brit. Hym., 2nd ed., p. 10, ♀ only.

Very like the preceding, but rather smaller, and at once distinguishable by the long face, which is longer than wide across the eyes, and also by the white colour in the ♂ being carried up high above the antennæ on each side, and the spots in the ♀ being linear and bordering the eyes, extending from above the antennæ, not quite to the base of the clypeus; the vertex of the head also is longer, and the puncturation of the abdomen in the ♀ much larger and deeper, its surface dull; the rugosities of the metathorax much coarser and shining. Wings somewhat dusky. ♂ genitalia unusually large for the size of the species. Stipites apparently with a transverse impressed line about the middle; their apex subtruncate. Sagittæ very long, as long as the stipites. See pl. vii., fig. 12. Length 6 mm.

Hab. Birch Wood, Kent (F. Smith).

6. *Prosopis hyalinata*, Smith.

Smith, Trans. Ent. Soc. Lond., iv., p. 33; Cat. Brit. Hym., 2nd ed., p. 12.

Black, shining; face below the antennæ in the ♂ white, the white colour extending slightly above their insertion at each side: face in the ♀ with two triangular lateral spots. Antennæ in the ♂ ferruginous beneath; tubercles, base of all the tibiæ, the anterior tibiæ in front, and all

the tarsi in the ♂, also white; two spots on the prothorax, the tubercles, and the bases of all the tibiæ in the ♀, white.

Head and thorax very largely and coarsely punctured in the ♂, more finely in the ♀; face subelongate, very narrow between the eyes in the ♂, and covered in that sex with white hairs; both sexes with the space between the eye and the base of the mandibles unusually long, forming a distinct cheek, being nearly as long as the width of the base of the mandibles; scape of the antennæ in the ♂ short and slightly thickened; thorax, especially at the sides, with short pale hairs; 1st segment of the abdomen very shining, with a narrow line of silvery hairs on each side at the apex, very largely and remotely punctured in the ♂, finely, very shallowly, and rather remotely in the ♀, the punctures in the latter sex being sometimes scarcely observable; 2nd and following segments in the ♂ less strongly and more closely punctured than the 1st, in the ♀ extremely finely punctured; apical segment in both sexes with fine short grey hairs; the genital segments of the ♂ of quite a different form to those of any other British species; the stipites are very elongate and narrow, fringed with long hairs at the apex; the sagittæ are very short, and from beneath there extends a narrow clear testaceous process dilated at the apex into a wide spoon-shaped form; this latter is the ventral valve of the 8th abdominal segment (see pl. vii., fig. 10); legs with short silvery hairs. Length 6 mm.

Hab. Common in many places on flowers of bramble, &c., especially near the seaside.

7. *Prosopis confusa*, Nyl.

Nyl., (Revisio), Not. Salls. Faun. Flor. Fenn., Förh. ii., p. 232 = *punctulatissima*, Smith, Cat. Brit. Hym., 2nd ed., p. 10, ♂.

Very like the last in the general appearance of the ♀, but both sexes may be distinguished thus:—

♂ rather larger; mandibles with a white line; face wider, without long white hairs. Antennæ entirely black, or with a yellow line on the scape; thorax much more finely and closely punctured, the interstices dull; metathorax finely and longitudinally rugose; 1st segment of the abdomen finely and shallowly punctured,

with a very distinct line of silvery hairs on each side at the apex; the following segments finely punctured, each with a grey pubescence at the sides, almost forming an apical band; genitalia with the stipites short and fringed with long hairs at the apex; no projecting spoon-like process. (See pl. vii., fig. 8.)

♀ very like that of *hyalinata*, and probably in many collections mixed with it; but it has the antennæ entirely black, the thorax wider across the middle, and the apical segments irregularly and indefinitely punctured; whereas in *hyalinata* the puncturation is fine but distinct. Length 6—7 mm.

Hab. Flowers of brambles, &c.; Chobham, Hastings, Guildford, Reigate, &c.

8. *Prosopis brevicornis*, Nyl.

Nyl., (Suppl.), Not. Salls. Faun. Flor. Fenn., Förh. ii., p. 95 = *perforator*, Smith, Cat. Brit. Hym., 2nd ed., p. 13.

Rather smaller than either of the preceding. Black, with the flagellum of the antennæ more or less fulvous beneath; the face below the antennæ in the ♂, a spot on each side of the face in the ♀ bordering the eye (often absent), the anterior tibiæ in front in the ♂, and the posterior tibiæ at the base in both sexes, white; the white colour of the face extending above the antennæ at the side; basal joint of the intermediate and posterior tarsi white in the ♂.

Head and thorax deeply punctured. Vertex of the head squarer than in the other species, especially in the ♀. Scape of the antennæ in the ♂ very much swollen towards the apex, in form like an inverted cone; in the ♀ simple. Thorax dull, punctured like the head. Wings slightly dusky. Abdomen dull and closely punctured in the ♂, shining, very finely and remotely punctured in the ♀; both sexes with a very indistinct lateral line of silvery hairs at the apex of the basal segment. ♂ genitalia with the stipites simple and somewhat pointed, with long apical hairs; the sagittæ dentate on their inner margin near the base. (See pl. vii., fig. 6.) Length $4\frac{1}{2}$ — $5\frac{1}{2}$ mm.

Hab. Hastings, Reigate, Southwold, Chobham, &c. Not rare. May be bred from bramble-stems.

9. *Prosopis pictipes*, Nyl.

Nyl., (Suppl.), Not. Salls. Faun. Flor. Fenn., Förh. ii., p. 95 = *varipes*, Smith, Cat. Brit. Hym., 2nd ed., p. 12.

Black; the antennæ fulvous beneath; face below the antennæ, white, and the basal joint of all the tarsi, and the base of all the tibiæ, yellow in the ♂; face in the ♀ with two yellow oval spots placed diagonally, the tubercles yellow, and the base of the posterior tibiæ white. Head and thorax punctured; the head in both sexes, and in the ♂ especially, much more closely than the thorax. Eyes in the ♂ converging much more rapidly to the clypeus than in most of the species, and the clypeus very narrow; ♀ with the face shorter and rounder than in most of the species. Scape of the antennæ simple in the ♂, not swollen or dilated. Abdomen dull in the ♂, and rather largely punctured, especially on the basal segment, the puncturation of the following segments closer and finer; in the ♀ the surface is more shining, and the puncturation is finer and remote. Genitalia of the ♂ with the stipites and sagittæ simple; the stipites with long apical hairs. (See pl. vii., fig. 5.) Length $4\frac{1}{2}$ — $5\frac{1}{2}$ mm.

Hab. Hayling Island; Reigate; Chobham.

Easily distinguished from *brevicornis* by the simple scape of the ♂ and the diagonal facial spots of the ♀, and yellow tubercles.

ACUTILINGUES.

- | | |
|---|----------|
| 1st joint of the labial palpi not many times longer than apical | Div. I. |
| 1st joint of labial palpi many times longer than apical .. | Div. II. |

Division I.

- | | |
|--|-------------------|
| (8) 1. Front wings with three submarginal cells. | |
| (7) 2. Apical joint of antennæ not obliquely truncate. | |
| (6) 3. 2nd and 3rd joints of antennæ subequal. | |
| (5) 4. Tongue lanceolate, sides rounded; abdomen very shining, red at the base | <i>Sphecodes.</i> |
| (4) 5. Tongue acute, sides sinuate; abdomen rarely red, and then only in the ♂ | <i>Halictus.</i> |
| (3) 6. 2nd joint of antennæ not half so long as the 3rd | <i>Andrena.</i> |
| (2) 7. Apical joint of the antennæ obliquely truncate .. | <i>Cilissa.</i> |
| (1) 8. Front wings with two submarginal cells. | |
| (10) 9. Posterior tibiæ and basal joint of tarsi not dilated | <i>Dasypoda.</i> |
| (9) 10. Posterior tibiæ and basal joint of tarsi dilated .. | <i>Macropis.</i> |

SPHECODES, Latr.

Latr., Hist. Nat., xiii., p. 368. For figures of generic characters see F. Smith, Cat. Brit. Hym., 2nd ed., pl. vi.

Tongue acute, its sides rounded; paraglossæ small, not acute; labial palpi 4-jointed; maxillary palpi 6-jointed; anterior wings with three submarginal cells; ♀ with the posterior tibiæ only sparsely clothed with hairs. Abdomen polished and shining in both sexes, and more or less red.

This genus is closely allied to *Halictus*, but the shining red body will, as a rule, distinguish any of its species at once. There are some red-bodied species of *Halictus*, but they have all the abdomen more or less clothed with hairs, or banded with hairs at the apex of the segments.

All the species are very closely allied, and some authors have considered them all as varieties of one species; but when the ♂ genitalia are examined and the apical dorsal valves of the females, I think little doubt can be felt as to their distinctness.

- (4) 1. Posterior wings with seven to ten hooks. Antennæ in ♂ long; 3rd joint not one-fourth the length of the 4th.
- (3) 2. Vertex of head much narrowed behind the eyes. ♂; genitalia with the squama produced into a membranous wing on its inner margin, and terminating in two unequal, densely hairy, processes, of which the upper is much the longer, and is produced and widened at the apex. ♀; apical dorsal valve narrow and linear *gibbus*.
- (2) 3. Vertex in both sexes usually subquadrate, though very variable in this respect. Squama of ♂ genitalia not winged, and ending in two subequal processes, sparingly clothed with short hairs. ♀; apical dorsal valve wide and flat *subquadratus*.
- (1) 4. Posterior wings with five to six hooks. Antennæ in ♂ short; 3rd joint much more than one-fourth the length of the 4th.
- (10) 5. Stipites of the ♂ genitalia not grooved. Antennæ with the joints much produced and rounded in front; ♀ with the puncturation of the thorax large and close; 3rd segment of abdomen without a lateral black spot or fovea.
- (9) 6. Surface of genitalia in ♂ longitudinally striate; 2nd submarginal cell longer than wide in both sexes.

- (8) 7. Larger; ♂ genitalia with the sagittæ very narrow, and fringed with short hairs; the squama membranous and somewhat quadrate, with a thickened semi-lunate central region; ♀ with the apical dorsal valve wide, slightly reflexed, and shining at the edges *pilifrons.*
- (7) 8. Smaller; ♂ genitalia with the sagittæ much widened at the base; the squama produced into two processes, of which the lower one is rather the longer; ♀ apical dorsal valve narrower, dull, and with an impression running parallel to its edge round its apex *similis.*
- (6) 9. Surface of genitalia in ♂ finely rugose, not longitudinally striate; 2nd submarginal cell in both sexes, on its lower margin, as wide as long, narrowed above *puncticeps.*
- (5) 10. Punctures of thorax fine and distant; genitalia of ♂ with the stipites widely grooved; ♀ with the 3rd segment of the abdomen generally with a small spot or fovea on each side near the base; apical dorsal valve narrow *ephippium.*

1. *Sphcodes gibbus*, Linn.

Linn., *Syst. Nat.*, ed. x., vol. i., p. 571; Smith, *Cat. Brit. Hym.*, 2nd ed., p. 17.

Black, shining; thorax largely and remotely punctured; abdomen red, with the base and apex black; wings brown, 2nd submarginal cell narrow.

♂. Head dull, rugosely punctured; face in front of the antennæ clothed with silvery white hairs. Antennæ with the 2nd and 3rd joints transverse and subequal in length; the 4th very much longer, more than twice as long as the other two together; joints of the flagellum, especially near its apex, with a narrow band of pale fine hairs; vertex very slightly produced behind the eyes, clothed with greyish hairs; mesothorax sparingly clothed with very short greyish hairs, shining, and very largely punctured; post-scutellum and metathorax rugose, the basal area of the latter longitudinally rugose. Abdomen elongate, shining, remotely punctured, testaceous-red; the 1st segment, except at the apex, occasionally a band on the 2nd and 3rd, and the whole of the 4th and following segments, black; beneath shining, finely punctured; for genitalia see pl. viii., fig. 3; legs black; extreme apex of the tarsi piceous.

♀. Wider than the ♂; antennæ short; face clothed with grey hairs; mesothorax more shining than in the ♂, very largely and remotely punctured. Abdomen ovate,

punctured and coloured as in the ♂, but with only the extreme base of the 1st segment and the three apical segments black; 5th segment clothed with a dense fringe of thick, black, curved hairs at the apex; 6th segment with the central naked portion linear and narrow; beneath shining, punctured, sparsely clothed with brown hairs; 6th segment rather raised at the apex, and with an apical bristly tuft of brown hairs; legs somewhat piceous, clothed with brown hairs, and those at the base of the posterior tibiæ whitish. Length 8—10 mm.

Hab. Common in summer; the ♂ appears in July and August.

2. *Sphecodes subquadratus*, Smith.

Smith, Zool., vol. iii., p. 1014, fig. 5; Cat. Brit. Hym., 2nd ed., p. 19.

Very like the preceding, of the same size, and with the same sparse puncturation of the thorax, but as a rule with the vertex of the head in both sexes incrassate.

The ♂ differs further from *gibbus* in having the wings clearer, and the genitalia of quite a different form; (see pl. viii., fig. 2). The ♀ in having the wings clearer, the apex of the 5th segment with paler brown hairs, not curved as in *gibbus*, and the apical dorsal valve with the central glabrous portion wide and flat; apical ventral valve simply hairy, without the bristly tuft of hairs observable in the preceding.

Hab. Not quite so common as *gibbus*, but often occurring with it, and the incrassate vertex of the head generally giving it a very distinct appearance.

3. *Sphecodes pilifrons*, Thoms.

Thoms., Opusc. Ent., i., p. 99 = *rufiventris*, Smith (nec Wesm.), Cat. Brit. Hym., 2nd ed., p. 18.

Black. Abdomen with the apex of the 1st segment, the 2nd, and the base of the 3rd in the ♂, red; in the ♀ with the 4th and 5th. Thorax closely punctured. Wings slightly dusky; posterior wings with five to six hooks. Like the two preceding in colour, but easily distinguished by the closely punctured dull mesothorax,

and the number of alar hooks (five to six); the ♂ differs also essentially in the short antennæ, which hardly reach to the base of the scutellum, the much denser grey pubescence of the head and thorax, the rather less elongate abdomen, and the form of the genitalia (see pl. viii., fig. 5).

Hab. A common species, occurring often with the two preceding.

4. *Sphecodes similis*, Wesm.

Wesm., Bull. Acad. Brux. 1835, vol. ii., p. 279.

This species is very closely allied to *pilifrons*, but it is smaller; the ♂ has the joints of the antennæ more swollen in front, and the antennæ altogether rather thicker, the thorax less pubescent, the abdomen shorter and oval, and generally with a black spot on each of the segments, sometimes entirely black, and the genitalia differently shaped, as shown in pl. viii., fig. 4.

The ♀ only differs from *pilifrons* in its smaller size and its narrower dorsal apical valve, the margins of which are more reflexed, and have an impressed line within the reflexion. Length 6—8 mm.

Hab. Reigate; Chobham; Southwold; Worthing; and probably common generally, but mixed with the preceding.

5. *Sphecodes puncticeps*, Thoms.

Thoms., Opusc. Ent., i., p. 99; Hym. Scand. ii., p. 157.

Of this species only the ♂ has occurred, so far as I know, in England, which may be distinguished from its allies by the wider 2nd submarginal cell of the upper wings, which is slightly narrowed above, and by the fine reticulation of the surface of the genitalia, which in the other British species are longitudinally strigose; (see pl. viii., fig. 1); the wings also are less dusky than in most of the species. The ♀ should (according to Thomson) have the wings as in the ♂, and the dorsal apical valve narrow. Length, ♂ 6 mm.

Hab. I have one specimen taken at Chobham, and another from Bournemouth.

6. *Sphecodes ephippium*, Linn.

Linn., Syst. Nat., ed. xii., p. 944; Smith, Cat. Brit. Hym., 2nd ed., p. 20.

One of the smallest species of the genus, but often confounded with small examples of some of the preceding.

The ♂ may be recognised by its antennæ, of which the joints are scarcely produced and swollen in front at all, and the 4th joint is scarcely longer than the 5th, and about equal to the 2nd and 3rd together; also the joints in front have the pubescence extending almost to their apex; another well-marked character is the widely grooved stipites of the genitalia; (see pl. viii., fig. 6). The elongate abdomen of this little species is often banded with black on all the segments.

The ♀ may be recognised by its shining, finely punctured, thorax, the narrow apical dorsal valve of the abdomen, and the piceous tarsi and pale front to the anterior tibiæ, and generally by the small black fovea at the base of the 3rd segment of the abdomen on each side. Length 5—6 mm.

Hab. Very common, and generally distributed.

HALICTUS, Latr.

Latr., Hist. Nat., xiii., p. 364. For figures of generic characters see F. Smith, Cat. Brit. Hym., 2nd ed., pl. vi.

Tongue acute, its sides emarginate; paraglossæ subacute; labial palpi 4-jointed; maxillary palpi 6-jointed. Wings with three submarginal cells. Antennæ in the males long; the abdomen elongate and cylindrical, except in one or two species; apical ventral segment not produced as in *Andrena*. Antennæ in the females short; the abdomen ovate; 5th segment with a narrow central dorsal rima; 6th dorsal segment almost hidden.

The genitalia of the males afford excellent specific characters.

The head and thorax in nearly all the species of this genus are clothed with longish hairs; the abdomen is generally banded or spotted at the sides of the segments with white pubescence. The chief specific

characters seem to lie in the shape of the face and metathorax, and the sculpture and puncturation of the various portions of the insect; but it requires great care and very minute examination in some cases to refer an individual with certainty to its proper species, especially in the group of *minutus*, *nitidiusculus*, &c.

This is amongst the most difficult of our British genera of Aculeates to tabulate, and the tables I have prepared are far from satisfactory; still I hope they will be of some use as an aid to distinguish the species. I have divided the genus into six divisions:—

- | | | |
|------|---|-----------|
| (2) | 1. White pilose bands of the abdomen situated on the apical margins of the segments | Div. I. |
| (1) | 2. White pilose bands of the abdomen, when present, situated on the basal margins of the segments. | |
| (10) | 3. Species not small and æneous. | |
| (5) | 4. Large or medium-sized species; abdomen deep black, with conspicuous pubescent spots or bands on the 2nd, 3rd, and sometimes 4th segments; posterior margins of segments not testaceous .. | Div. II. |
| (4) | 5. Large or medium-sized species, with pale apical margins to the segments; or small species, with scarcely any indication of the lateral spots, or with the body entirely black. | |
| (7) | 6. Hind margins of the segments rather widely testaceous; ♂ with the body smooth and glabrous beneath; ♀ with the brow of the metathorax sharply truncate, or with a more or less raised line at the sides or very rugose, the brow not smoother than the rest | Div. III. |
| (6) | 7. ♂ with the segments of the body fringed beneath; metathorax in the ♀ rugose at the base, but smoother towards the brow, which is more or less rounded, and has no signs of a raised lateral line. | |
| (9) | 8. Surface of thorax very smooth and polished, puncturation remote or very coarse and rugose; metathorax radiately rugose. In one species, <i>puncticollis</i> , although the centres of the punctures are remote, the actual punctures are so large that their edges are pretty close together | Div. IV. |
| (8) | 9. Surface of thorax rarely polished, but under a strong power seen to be finely rugose between the punctures; puncturation fine and close | Div. V. |
| (3) | 10. Species small and æneous, at least as regards the thorax | Div. VI. |

Division I.

- (4) 1. White bands of the abdomen interrupted only on the upper segments.
- (3) 2. ♂, mandibles not dilated; ♀ with yellow posterior tibiæ *rubicundus*.
- (2) 3. ♂, mandibles dilated; ♀, posterior tibiæ black .. *4-cinctus*.
- (1) 4. Segments of abdomen with only a spot on each side *maculatus*.

1. *Halictus rubicundus*, Christ.

Christ, Hym., p. 190, pl. xvi., fig. 10; Smith, Cat. Brit. Hym., 2nd ed., p. 79.

Black; head and thorax covered with brown hairs (fading to grey in old specimens); segments of the abdomen with white apical fringes; posterior tibiæ and tarsi clear testaceous in both sexes.

♂ with the head finely and closely punctured; the clypeus and labrum flavous. Antennæ reaching to about the scutellum, slightly brownish on their under side. Thorax punctured as the head; metathorax finely and longitudinally rugose at its extreme base, rugosely punctured on the rest of its surface. Wings hyaline, scarcely darker at the apex. Abdomen elongate, very finely punctured, the puncturation somewhat rugose and irregular; the 1st, 2nd, and 3rd segments each with a narrow apical band of white hairs, the 1st and 2nd interrupted in the middle; surface of all the segments clothed with scattered pale hairs; beneath with the segments depressed; the 4th and 5th emarginate, especially the 5th; (for genitalia see pl. viii., fig. 8). All the femora black; the tibiæ and tarsi flavous, with a dark spot on the inner side of the former.

♀ very like the ♂ in coloration, but wider and more massive. Antennæ short; clypeus black; head and thorax closely punctured, densely clothed with brown hairs; metathorax rugosely punctured. Abdomen finely punctured, banded as in the ♂, but with an entire band on the 4th segment; 5th segment densely covered with golden hairs on each side of the central ridge. Legs covered with golden hairs. Anterior tarsi only pale; intermediate tibiæ at the apex and tarsi, and the whole of the posterior tibiæ and tarsi, clear testaceous. Length 10 mm.

A very distinct species, and the ♀ known at once from

the others which have apically banded segments, by the clear yellow tibiæ; the ♂ by its simple mandibles, and the bands, not spots, at the sides of the segments.

Hab. Common in many sandy places.

2. *Halictus quadricinctus*, Fab.

Fab., Syst. Piez., p. 319; Smith, Cat. Brit. Hym., 2nd ed., p. 80.

Black; head and thorax rather densely clothed with hairs in ♂, sparingly clothed with dull brown hairs in the ♀; segments of the abdomen with white apical bands. Wings hyaline.

♂. Head elongate; clypeus much produced, with a whitish yellow transverse spot at the apex; mandibles, looked at sideways, dilated at the base. Antennæ long, reaching to beyond the thorax; surface of the head closely punctured. Thorax punctured as the head, rather thickly clothed with greyish brown hairs; metathorax finely rugose. Abdomen elongate, subclavate, punctured, and clothed with very short erect hairs; the first four segments each with an apical band of white pubescence, that of the 1st segment largely interrupted in the middle; beneath flat, almost glabrous; 4th and 5th segments emarginate, and fringed at the apex with short golden hairs; (for genitalia see pl. viii., fig. 7). Legs covered with short hairs. Anterior and intermediate femora in front, and all the tibiæ and tarsi, testaceous; posterior tibiæ with a black spot on each side.

♀. Something like that of *rubicundus*, but with all the legs black, the hairs only being golden, and the tarsi more or less testaceous. Head and thorax punctured; metathorax finely rugose. Abdomen scarcely shining, closely and evenly punctured all over; first four segments each with a white apical band of pubescence; those of the 1st and 2nd segments interrupted; 5th segment with pale golden hairs on each side of the central rima; beneath densely clothed with long golden hairs. Length 9 mm.

Hab. Very rare. Sir Sidney Saunders has taken the ♀ near Eastbourne, and both sexes near Brighton in August; and I am indebted to him for the specimens from which I have described. Mr. Dale took the ♀ in the Isle of Portland, and Mr. Kirby quotes the London

district and "Blakenham Parvum" as localities for it. It is a common continental species.

3. *Halictus maculatus*, Smith.

Smith, Zool. vi., p. 2172, ♀; Cat. Brit. Hym., 2nd ed., p. 86.

Black; ♂ dull, ♀ shining; first four segments each with a white pilose spot on each side at the apex. Vertex of the head incrassate in both sexes. Wings smoky brown.

♂ rugosely punctured; head and thorax clothed with ochreous-brown hairs; face densely covered with whitish hairs. Clypeus with a white spot at the apex; mandibles testaceous, except at the base, not dilated. Antennæ reaching to about the scutellum, brown beneath; vertex flat and produced considerably behind the eyes. Thorax punctured like the head; dorsal area of the metathorax finely rugose; the rest of the metathorax punctured. Abdomen closely punctured, the punctures largest on the basal segment, and becoming finer on the apical segments. Each segment depressed at the base and apex, and bearing a short narrow line of white silvery hairs on each side along the apical margin of the 1st, 2nd, 3rd, and 4th; beneath flat, 4th and 5th segments not emarginate at the apex; surface punctured and almost naked; (for genitalia see pl. viii., fig. 12). Legs covered with short silvery hairs; front tibiæ anteriorly, and intermediate and posterior tibiæ at the base and apex, and all the tarsi, yellow.

♀. Head closely punctured, wider than the thorax; vertex considerably produced behind the eyes; face sparingly clothed with golden hairs. Thorax more remotely punctured than the head, shining, with scattered golden hairs; post-scutellum very finely and closely punctured; metathorax finely rugose. Abdomen shining, finely punctured, narrower and more parallel-sided than usual for a ♀ of this genus; each of the first four segments with a lateral spot of silvery hairs at the apex; 5th segment with pale golden hairs on each side of the centre; beneath and legs densely clothed with golden hairs. Length 9 mm.

Hab. Weybridge; Hastings, August, 1879; Blackwater. These are the only localities recorded, and in

each case a single ♀ was captured. I have described the ♂ from a continental specimen.

Division II.

- | | | | |
|------|-----|--|---------------------|
| (2) | 1. | Tibiæ pale in both sexes | <i>xanthopus.</i> |
| (1) | 2. | Tibiæ dark in both sexes. | |
| (12) | 3. | Head and thorax without a greenish tinge. | |
| (5) | 4. | Pubescence of thorax ash grey | <i>6-notatus.</i> |
| (4) | 5. | Pubescence of thorax more or less brown. | |
| (7) | 6. | ♂; abdomen beneath without long hairs; abdominal fasciæ of ♀ more or less fulvous .. | <i>lævigatus.</i> |
| (6) | 7. | Abdomen of ♂ clothed with long hairs beneath; abdominal fasciæ of ♀ white. | |
| (11) | 8. | Tarsi of ♂ entirely black, or white above only on the basal joint; abdominal bands in ♀ entire, or nearly so. | |
| (10) | 9. | Tarsi of ♂ with the basal joint pale; basal segment of body in ♀ closely and evenly punctured all over | <i>leucozonius.</i> |
| (9) | 10. | Tarsi of ♂ entirely black; basal segment of body in ♀ shining and somewhat remotely punctured, especially about the middle | <i>zonulus.</i> |
| (8) | 11. | Tarsi of ♂ entirely yellowish; abdominal segments of ♀ with only a white spot on each side | <i>4-notatus.</i> |
| (3) | 12. | Head and thorax more or less greenish | <i>prasinus.</i> |

4. *Halictus xanthopus*, Kirby.

Kirby, Mon. Ap. Angl. ii., p. 79; Smith, Cat. Brit. Hym., 2nd ed., p. 81.

Black; head and thorax covered with bright brown hairs; wings slightly brownish; 2nd, 3rd, and 4th segments of the abdomen with a white basal band; tibiæ testaceous in both sexes.

♂. Head punctured; face clothed with long pale hairs. Apex of the clypeus with a pale transverse spot. Antennæ long, reaching to beyond the scutellum. Thorax rather more largely punctured than the head; metathorax finely rugose. Abdomen wide, obovate, shining, irregularly punctured on the basal segment, finely and closely punctured on the rest; basal segment clothed with long hairs, the rest having, besides the basal white bands, a few scattered golden hairs; beneath clothed with pale hairs; 5th segment with the apical margin emarginate in the centre; (for genitalia see pl. viii., fig. 13).

Legs densely clothed with pale hairs; all the tarsi and the posterior femora testaceous.

♀. Very like the ♂, but without the long antennæ. Head closely punctured, not so wide as the thorax; face sparingly covered with brown hairs. Thorax closely punctured, densely covered, especially at the sides, with bright brown hairs; metathorax finely rugose; dorsal area bounded posteriorly by a sharply raised line. Abdomen shining; 1st segment irregularly punctured at the base, closely and finely at the apex, clothed on its basal half and sides with brown hairs; other segments finely punctured; 2nd, 3rd, and 4th bearing a white basal band of pubescence; 5th segment with bright golden hairs on each side of the rather wide piceous central rima; beneath densely clothed with golden brown hairs. Legs covered with golden hairs; posterior tibiæ and tarsi testaceous; inner spur of each posterior tibia with several blunt teeth along its edge. Length 12—13 mm.

Hab. Brighton, Hastings, Ventnor, Arundel, Littlehampton, Southend, and near Deal. A local species, but occasionally plentiful, and very distinct from any other British *Halictus*.

5. *Halictus leucozonius*, Schrank.

Schrank., Enum. Ins. Austr., p. 406, n. 819; Smith, Cat. Brit. Hym., 2nd ed., p. 83.

Black; head and thorax sparsely clothed with grey-brown hairs; ♂ with the basal joint of the intermediate and posterior tarsi, except at the extreme apex, white; ♀ with the basal segment of the abdomen dull, finely and evenly punctured all over; 2nd, 3rd, and 4th segments with white basal bands.

♂. Head finely and closely punctured, about as long as wide across the eyes; face clothed with white pubescence. Clypeus with a white apical spot. Antennæ reaching to about the scutellum. Thorax somewhat rugosely punctured, clothed with brownish grey hairs; metathorax truncate posteriorly, its basal area triangular and longitudinally rugose; metathorax clathrately rugose beyond. Wings hyaline. Abdomen elongate-oval, finely but not very closely punctured, and clothed sparingly with short erect white hairs; the 1st segment on its basal half rather more densely covered with longer hairs; 2nd,

3rd, and 4th segments with a basal band of white pubescence, widening at the sides; beneath densely clothed with long white hairs; (for genitalia see pl. viii., fig. 10). Legs covered with short white hairs; base of posterior tibiae, and the basal joint of the intermediate and posterior tarsi, white, except the extreme apex of the latter; apical joint of all the tarsi brown.

♀. Considerably larger than the ♂; face nearly round; head finely punctured. Thorax closely punctured, the puncturation closer in some specimens than in others; scutellum densely hairy; metathorax as in the ♂. Wings slightly dusky. Abdomen ovate; the basal segment dull, finely punctured all over; 2nd, 3rd, and 4th segments each with a white basal band; 5th segment on each side of the central rima, and all the segments beneath and the legs, densely clothed with golden hairs. Length 8—10 mm.

Hab. Very common and generally distributed.

6. *Halictus zonulus*, Smith.

Smith, Zool. vi., p. 2171; Cat. Brit. Hym., 2nd ed., p. 84.

Black; head and thorax covered with brown hairs; ♂ with the legs entirely black; ♀ with the 1st segment of the abdomen shining, sparsely punctured about its disk; ♂ and ♀ nearly equal in size; 2nd, 3rd, and 4th segments of the abdomen each with a white basal band.

♂ differs from *leucozonius* by its larger broader form, its large thick head and round face, its wide abdomen, almost as wide as that of the ♀, the truncate and somewhat bilobed anal segment, and the entirely black legs; (for genitalia see pl. viii., fig. 9).

♀ differs by its more shining body and irregularly punctured basal segment, which is almost impunctate and highly polished in the middle, the curved, not angular, margin of the metathoracic area, and the paler stigma of the wings. Length 8—9 mm.

Hab. Not so common as the preceding, but generally distributed.

7. *Halictus quadrinotatus*, Kirby.

Kirby, Mon. Ap. Angl. ii., p. 79; Smith, Cat. Brit. Hym., 2nd ed., p. 85.

Very like a small *leucozonius*, but known at once by the following characters:—

The ♂ has the metathorax more finely rugose, and its basal area not bounded at the apex by a raised angulated ridge; the clypeus much less produced and wider; the tarsi entirely pale, only the apical joints slightly piceous; (for genitalia see pl. viii., fig. 11).

♀ with the face almost broader than long, the post-scutellum not villose; the metathorax rounded posteriorly. Abdomen shining and irregularly punctured; basal segment with only a very few short hairs; 2nd and 3rd segments each with two white lateral basal spots; the 4th segment covered with grey hairs; the 5th with golden hairs on each side of the central rima. Length 7—8 mm.

Hab. Generally distributed and not rare; Chobham, Hayling Island, Tunbridge Wells, Reigate, &c.

8. *Halictus levigatus*, Kirby.

Kirby, Mon. Ap. Angl. ii., p. 75; Smith, Cat. Brit. Hym., 2nd ed., p. 90, ♂ nec ♀; ♂ = *lugubris*, Kirby, Smith, l. c., p. 83.

Head and thorax covered with bright brown hairs. Abdomen very shining, remotely punctured; 2nd and 3rd segments with a white basal band in the ♂; 2nd, 3rd, and 4th with an ochreous basal band in the ♀, more or less interrupted in the centre.

♂. Black, shining; head rugosely punctured, wider across the eyes than long; clypeus not spotted; face below the antennæ covered with white, somewhat adpressed, hairs; above them with brown erect hairs. Antennæ reaching to just beyond the metathorax. Thorax strongly and rather largely punctured, covered with brown hairs; metathorax shining, sharply truncate posteriorly, its basal area subtriangular, deeply and longitudinally rugose, beyond the basal area largely clathrate. Abdomen elongate, shining, deep black, remotely punctured; 1st segment with erect hairs on its basal portion; 2nd and 3rd segments with a band of

white hairs at the base, more or less interrupted in the middle; 5th and 6th segments clothed with scattered hairs, the 5th with a slight indication of a basal band; beneath nearly flat and almost glabrous, 4th and 5th segments slightly emarginate posteriorly, 5th depressed, with a slight dorsal line; legs, with the tarsi and extreme base of posterior tibiæ, pale, three apical joints of posterior tarsi fuscous; (for genitalia see pl. ix., fig. 18).

♀. Head and thorax covered with bright chestnut-brown hairs; head closely punctured. Thorax remotely punctured on the disk; metathorax shining, looked at from in front sharply truncate posteriorly, its basal area longitudinally rugose, bounded behind by a curved line. Abdomen deep black, very shining; 1st segment clothed with brown hairs at the base, remotely punctured; 2nd, 3rd, and 4th segments rather more closely punctured, each with an ochreous basal band of pubescence, and clothed beyond it with scattered brown hairs; 5th segment with golden brown hairs on each side of the rima; beneath and legs densely clothed with brown hairs. Length 8—9 mm.

Hab. Not common. Reigate; Guildford; Shipley, near Horsham; Greenwich; Charlton; Ventnor; Bristol; Scotland.

♀ quite distinct from any other of its group by the bright brown head and thorax, and the ochreous bands of the abdomen. The ♂ by its elongate shining abdomen, nearly glabrous beneath, and its black clypeus.

9. *Halictus sexnotatus*, Kirby.

Kirby, Mon. Ap. Angl. ii., p. 82, pl. xv., figs. 7, 8; Smith, Cat. Brit. Hym., 2nd ed., p. 84.

Black; head and thorax covered with ashy grey hairs. Abdomen shining; 2nd, 3rd, and 4th segments with a basal spot, on each side, of snow-white pubescence; legs of the ♂ entirely black. Wings infuscate.

♂. Head and thorax finely and closely punctured; face about as long as wide across the eyes. Clypeus rather narrow, white at the apex. Antennæ reaching to the middle of the metathorax; mesothorax densely and very finely punctured, the punctures rather farther apart on the disk; post-scutellum densely villose; metathorax rounded posteriorly, finely rugose on its basal area,

with a slightly raised dorsal line. Abdomen subelongate, finely punctured, the puncturation of the basal segment rather more remote than that of the following ones; segments beneath not depressed, clothed with somewhat adpressed hairs; (for genitalia see pl. viii., fig. 14). Legs clothed with grey hairs.

♀. Only differing from the ♂ in the wider shape, shorter antennæ, black clypeus, and rather more shining abdomen, which is densely hairy beneath. Length 10—12 mm.

Hab. Rare. Chobham, Weybridge, Barham, &c. Known from all the British species by its ashy grey thorax and large size.

10. *Halictus prasinus*, Smith.

Smith, Zool. vi., p. 2169, 1848; Cat. Brit. Hym., 2nd ed., p. 92 = *hæmorrhoidalis*, Schk.

Black; face elongate in both sexes, much narrowed in front; clypeus much produced; apical segment of the abdomen in the ♂ red; head and thorax in the ♀ with a greenish tinge.

♂. Head and thorax black, with a very slight greenish tinge, finely and closely punctured; face elongate, covered with greyish white hairs; clypeus considerably produced, truncate at the apex, and sometimes white across its apical half. Antennæ reaching to beyond the scutellum. Thorax covered with short greyish hairs; meta-thorax finely and longitudinally rugose, its brow semi-circularly rounded. Abdomen slightly shining, rather finely and clearly punctured; 1st segment covered at the sides with whitish pubescence; 2nd, 3rd, and 4th segments with a lateral spot of white pubescence; 5th segment with an almost entire basal band; 7th segment red; beneath, 4th segment emarginate, but with a scarcely observable fringe, 5th segment emarginate, with a long fringe, apex of 6th segment much rounded. Genitalia with the sagittæ produced above the surface of the stipites into two curved knife-like edges; (see pl. ix., fig. 9). Tarsi, and sometimes the base and apex of tibiæ, pale.

♀. Larger and wider than the ♂. Head and thorax much as in that sex, except the black apex to the clypeus and the short antennæ; green metallic tinge rather more

distinct, and the puncturation rather closer and finer. Abdomen black, with perhaps a slight æneous tinge; basal segment shining, distinctly punctured, with an impunctate, somewhat raised, polished space on each side of the centre; base of the segment, on each side, covered with white pruinose pubescence; 2nd and 3rd segments with a white basal band of the same, and the 4th entirely covered with it; 5th covered with golden hairs, except the central rima; 6th with a rather narrow, somewhat truncate, dorsal valve; beneath with the segments largely punctured at the apex, and with long apical fringes. Legs black; scopa of posterior legs golden grey. Length 8—10 mm.

Hab. Chobham; Bournemouth; Poole; and Christchurch, Hants; Moffat, Scotland.

Division III.

- | | | | |
|------|-----|---|----------------------|
| (10) | 1. | Abdomen more or less punctured. | |
| (7) | 2. | 1st segment of abdomen scarcely punctured, the punctures scattered or fine and remote. | |
| (6) | 3. | Large or medium-sized species, 4 to 5 lines. Thorax very closely punctured. | |
| (5) | 4. | Larger; metathorax, looked at from above, posteriorly sharply truncate, its angles prominent and with their margins considerably raised; ♀ with the abdomen more shining; 2nd and following segments scarcely punctured; ♂ with the thorax more hairy, and the legs darker .. | <i>cylindricus.</i> |
| (4) | 5. | Smaller; metathorax not so sharply truncate; angles not prominent and scarcely margined; ♀ with the abdomen very closely and finely punctured on the 2nd and following segments; ♂ with the thorax less hairy, and the legs lighter | <i>albipes.</i> |
| (3) | 6. | Small species, 2¾—3 lines. Thorax rather remotely punctured | <i>pauillus.</i> |
| (2) | 7. | 1st segment of body very finely and closely punctured. | |
| (9) | 8. | Larger; metathorax in ♀ bounded posteriorly by a well-defined sharp ridge; basal segment of abdomen in both sexes exceedingly finely and closely punctured nearly up to its base .. | <i>malachurus.</i> |
| (8) | 9. | Smaller; in ♀ metathorax bounded by a very indefinite ridge; basal segment of abdomen in both sexes exceedingly finely punctured, but not so very closely, the puncturation only just extending on to the basal half | <i>longulus.</i> |
| (1) | 10. | Abdomen impunctate | <i>subfasciatus.</i> |

11. *Halictus cylindricus*, Fab.

Fab., Ent. Syst. ii., p. 302; Smith, Cat. Brit. Hym., 2nd ed., p. 87.

Black; head and thorax sparsely clothed with brown hairs; metathorax, viewed from in front, sharply truncate, its angles slightly reflexed. Abdomen in the ♂ elongate, generally more or less red; in the ♀ oval. Apical margins of the segments in both sexes widely pale; the 2nd, 3rd, and 4th segments in the ♂ and the 2nd and 3rd in the ♀ with a lateral basal spot of white pubescence.

♂. Head and thorax closely punctured; face elongate; eyes converging considerably towards the clypeus; mandibles divided from the eyes by a narrow cheek. Clypeus produced, sharply truncate in front, with a large pale spot at the apex; face below the antennæ covered with white hairs. Antennæ reaching to about the end of the metathorax. Thorax with the puncturation more distant than that of the head. Wings almost clear; nervures brown; metathorax, viewed from in front, sharply truncate behind, its apical margin reflexed near the lateral angles; viewed from above, with a somewhat triangular elathrate basal area. Abdomen shining, elongate, shallowly punctured; 1st, 2nd, and 3rd segments often more or less red at the sides and apex. Apical margins testaceous: 2nd, 3rd, 4th, and often 5th, segments at the base with a lateral white pubescent spot. Abdomen above with a few scattered brown hairs, beneath glabrous, nearly flat; (for genitalia see pl. ix., fig. 1). Legs black; the base and apex of the tibiæ and the tarsi pale; the apical joints of the latter brownish.

♀. Head and thorax finely and closely punctured, clothed with brown hairs; inner margins of the eyes converging slightly towards the clypeus; metathorax as in the ♂, but with its basal area semicircular. Abdomen oval, slightly wider than the thorax; basal segment very shining, clothed with scattered brown hairs at the base and sides, but glabrous on the disk and apex; the surface sparsely and very shallowly punctured, the following segments duller and clothed with a short brown pubescence, forming a distinct band at the apex; the 2nd and 3rd segments with a white lateral pubescent streak at the base; 5th densely clothed with golden brown hairs.

Beneath with the apical portions of the segments clothed with long hairs. Legs black, covered with golden brown hairs; the tarsi more or less testaceous. Length 8—10 mm.

Hab. Common and generally distributed.

12. *Halictus albipes*, Kirby.

Kirby, Mon. Ap. Angl. ii., p. 71; Smith, Cat. Brit. Hym., 2nd ed., p. 89.

This species is so closely allied to the last as to be distinguishable only by careful examination.

It is generally smaller, and the pubescence of the abdomen and legs is paler; in the ♂ the face is much longer, the metathorax longer, much less rugose, and without the sharpreflexed truncature of that of *cylindricus*; the tarsi are entirely pale; (for genitalia see pl. ix., fig. 8).

The ♀ is more difficult to recognise; the face is only slightly longer, but the metathorax, looked at from in front, is distinctly longer, its basal area less regularly rounded, and the truncature below it narrower, less distinct, and with the lateral angles not reflexed. Length 7—9 mm.

Hab. Common and generally distributed, often occurring with *cylindricus*.

13. *Halictus malachurus*, Kirby.

Kirby, Mon. Ap. Angl. ii., p. 67; Smith, Cat. Brit. Hym., 2nd ed., p. 88.

♂. Black. Head finely punctured. Antennæ pale beneath; face shorter than in either of the preceding; apex of the clypeus, labrum, and mandibles yellow; below the antennæ covered with white hairs, above them with scattered greyish brown hairs. Thorax not quite so finely punctured as the head, but more closely and evenly than in *cylindricus*; metathorax not truncate, dull, longitudinally rugose at the base, the rugosities gradually vanishing towards the apex; basal area not defined. Wings with their nervures pale. Abdomen dull, closely and evenly punctured all over, the 1st segment hardly less closely than the others; the apex of each segment narrowly testaceous, and all but the 1st clothed with a very short greyish pubescence; the 2nd and 3rd with an

ill-defined lateral spot of white pubescence at the base; beneath shining; (for genitalia see pl. ix., fig. 4). Legs: femora black, with their extreme apex pale; tibiæ pale yellow at the base and apex and along their upper margin; tarsi pale yellow; apical joint brown.

♀. Closely resembling *cylindricus* and *albipes*, but known at once by the close even puncturation of the 1st abdominal segment, and its greater width at the base; also by its metathorax, which, as described in the ♂, is without the well-defined basal area observable in those species. Unlike the ♂, however, the apex of the metathorax, viewed from in front, is truncate or slightly raised at the sides, but not sharply angulated at the sides as in *cylindricus*; the abdomen also is more densely clothed with pubescence, and the sides of the metathorax beneath far less rugose. Length 7—9 mm.

Hab. Not a common species. I have taken both sexes at Chobham, and the ♀ at Wandsworth; I have seen males from Hastings, and the late F. Smith took the ♀ at Cromer.

At Chobham, in April, 1878, there was a colony of this species burrowing in the path of a garden; the females flew about till nearly 3.30 p.m., and then commenced throwing up fresh mould from their burrows, but I failed to ascertain how late they continued their operations.

14. *Halictus longulus*, Smith.

Smith, Cat. Brit. Hym., p. 39 (1855); Cat. Brit. Hym., 2nd ed., p. 99.

♀. So like the preceding that it might easily be taken for a small variety of it; there are, however, points of difference which I think clearly indicate its right to be considered as a distinct species; besides its smaller size, its metathorax, looked at from in front, is not distinctly margined and truncate on the brow, is narrower towards the apex, and less rugose at the base; the 1st segment of the abdomen is rather more shining, punctured only on its apical half, and the puncturation distinctly sparser; the abdomen also is more elongate and more depressed.

The ♂, which I believe belongs to this species, is black, with the apex of the clypeus, the labrum, and the mandibles yellow; the antennæ reaching to about the

1st abdominal segment and fulvous beneath ; the thorax closely and distinctly punctured ; the metathorax very rugose, looked at from in front somewhat truncate, its basal area indefinite, irregularly rugose ; the abdomen is not very shining, distinctly punctured, the 1st segment rather more sparsely so than the others. Legs with the apex of the femora and the base of the tibiæ, and sometimes also the apex, and the tarsi, pale yellow ; (for genitalia see pl. ix., fig. 11). Length 6—7 mm.

Hab. Not common ; Isle of Wight, Chobham, &c.

I believe this ♂ is the same as that described by Smith, but I cannot follow him in the description of the metathorax ; he says, "the truncations irregularly transversely striate," and I am not clear as to his meaning.

15. *Halictus pauxillus*, Schenck.

Schenck, *Jahr. Ver. Nat. Herz. Nassau*, xiv., 1859, p. 287.

Smaller than any of the preceding, and about the size of *nitidiusculus* and *minutus*.

♂ only differs from that of the preceding species in being smaller, with a rounder face, rather shorter antennæ, and almost impunctate 1st abdominal segment ; the following segments also being more shining and less closely punctured than in *longulus* ; (for genitalia see pl. ix., fig. 10).

♀ black ; head and thorax punctured, the latter more remotely than in any of the other species of this group, somewhat shining, and with a strongly marked dorsal impression extending in some specimens to within a third of the base of the mesothorax ; nervures of the wings piceous ; metathorax clathrately rugose up to its brow, which is somewhat rounded, without prominent angles ; a slightly raised line runs below the brow on each side, giving the metathorax, in certain positions, a truncate appearance ; this character, however, seems to vary. Abdomen with the posterior margins of the segments widely testaceous ; basal segment very shining, almost impunctate ; following segments dull, clothed with a fine greyish yellow pubescence, and under a strong lens seen to be finely punctured ; 2nd segment with a lateral spot of white pubescence at the base. Legs inclining to be piceous, covered, as also the under

side of the abdomen, with long yellowish grey hairs. Length 5—6 mm.

Hab. Charlwood, Surrey; Hastings; Shere.

I have no doubt this species is generally common, though overlooked, as its ♀ very much resembles *nitidiusculus* in general appearance; its much more rugose metathorax, which is clathrately rugose right up to the brow and not only at the base, and its much more deeply punctured mesothorax, will easily distinguish it. The ♂ lacks the long ventral hairs of *nitidiusculus*.

16. *Halictus subfasciatus*, Nyl.

Nyl., Not. Salls. Faun. Flor. Fenn., Förh. ii., p. 200; Smith, Cat. Brit. Hym., 2nd ed., p. 92; ♂ = *fulvicornis*, K. = *levigatus*, Sm., Cat. Brit. Hym., 2nd ed.

♂ very distinct from any of the other black species by its very long antennæ, which reach as far as the 3rd abdominal segment. Head and thorax dull, very finely and very closely punctured, sparsely clothed with greyish yellow hairs. Clypeus pale yellow; face below the antennæ clothed with silvery hairs. Antennæ beneath bright fulvous. Wings with nervures piceous. Metathorax truncate behind, very rugose, the rugosities somewhat longitudinal at the base. Abdomen deep black, shining, all the segments distinctly punctured at the base, impunctate at the apex; 2nd and 3rd with a white basal band, often only visible at the sides. Apical segment with an angulated carina. Beneath with the segments flat, their apical margins nearly straight; the 6th rounded; (for genitalia see pl. ix., fig. 12). Legs with the tarsi, and sometimes the knees and apices of tibiæ, pale yellow.

♀ with the head and thorax punctured much as in the ♂, although perhaps not quite so closely. Metathorax sharply truncate posteriorly, its angles prominent; surface shining, longitudinally and somewhat clathrately rugose. Abdomen with the basal segment very shining, in most specimens impunctate, but occasionally with a few very shallow fine punctures; following segments less shining, clothed with fine short yellowish grey hairs; 2nd and 3rd segments at the base with small lateral white spots, often scarcely observable, as they are easily rubbed off. Apex of each segment

testaceous; beneath and legs clothed with yellowish grey hairs. Length 6—8 mm.

Hab. Reigate, Shere, Chobham, Worthing, Yorkshire, Scotland, &c.

Division IV.

- (2) 1. Abdomen impunctate, or nearly so *levis*.
 (1) 2. Abdomen punctured.
 (6) 3. Puncturation of thorax remote, not very coarse; flagellum of antennæ pale beneath in ♂.
 (5) 4. Smaller; antennæ of ♂ only just reaching to the scutellum; puncturation of thorax in the ♀ exceedingly fine *brevicornis*.
 (4) 5. Larger; antennæ of the ♂ reaching to the metathorax; puncturation of thorax in ♀ not very fine *villosulus*.
 (3) 6. Puncturation of thorax very coarse, giving it almost a rugose appearance; ♂ with the flagellum entirely black *puncticollis*.

17. *Halictus villosulus*, Kirby.

Kirby, Mon. Ap. Angl. ii., p. 62; Smith, Cat. Brit. Hym., 2nd ed., p. 91.

Black; the tarsi of the ♂ generally pale, but often dark outwardly.

Head closely and finely punctured; the face below the antennæ in the ♂ covered with silvery hairs. Vertex of the head and the thorax in both sexes sparingly clothed with long brownish grey hairs. Antennæ of the ♂ reaching to about the metathorax, pale beneath; in the ♀ only more or less rufescent towards the apex. Thorax very smooth and shining in both sexes, sparsely and shallowly punctured, the puncturation rather closer towards the margins. Metathorax rounded posteriorly in the ♂, somewhat truncate in the ♀, radiately rugose at the base; surface beyond the rugosities shining. Abdomen in the ♂ shorter and more ovate than in most of the species, shining, finely and regularly punctured on all the segments; sides and apex of the body covered with grey hairs; in the ♀ with the basal segment impunctate or nearly so; the following ones finely punctured and clothed with grey hairs; margins of all the segments narrowly testaceous. Abdomen beneath clothed with long greyish hairs in both sexes. Legs with greyish yellow hairs; (for ♂ genitalia see pl. ix., fig. 15). Length 7—8 mm.

Hab. Very common on *Crepis* and other yellow Compositæ.

18. *Halictus puncticollis*, E. Saund.

E. Saund., Ent. Mo. Mag. xv., p. 200 = *puncticollis*, Mor. ?

Very like the preceding, but slightly larger. The ♂ with the face longer and narrower; the antennæ entirely black. Thorax less shining and more closely punctured; metathorax much more rugose, its basal area distinctly enclosed. Abdomen much as in *villosulus*; (for genitalia see pl. ix., fig. 7.)

♀ with the face rather longer than that of *villosulus*; the thorax with much larger, more rugose, punctures, which, instead of being distant from each other about the width of three or four punctures, are scarcely distant more than two; metathorax clathrately rugose, basal area bounded by a raised line. Abdomen much like that of *villosulus*, but with only the margins of the 3rd and following segments testaceous. Length 8—8½ mm.

Hab. Hastings and Guestling.

19. *Halictus lævis*, Kirby.

Kirby, Mon. Ap. Angl. ii., p. 65; Smith, Cat. Brit. Hym., 2nd ed., p. 98.

Of this species I believe there are only two or three recorded British specimens, all of which are females.

It may be readily known by its large impunctate, or nearly impunctate, abdomen; the metathorax is formed very like that of *villosulus*, and the puncturation of the thorax is rather closer than in that species; the tarsi also are testaceous; it is a decidedly larger insect than *villosulus*. Length 8½ mm.

Hab. The only recorded locality is that given by Kirby—Nacton, Suffolk.

I cannot agree with Smith in thinking that Schenck's *lævis* is different. Smith owns that there are a few very fine punctures at the extreme base of the 2nd segment, and Schenck only says that Nylander was wrong in saying of the abdomen "absque ullâ puncturâ"; his description agrees excellently with our insect in all other respects. Smith quotes Thomson's *lævis* as identical with Kirby's; but here again, I think, he is mistaken, as

Thomson says "Mesonoto dense subtilissime punctato," which will not suit Kirby's species at all, and doubtless should be applied, as Thomson himself shows in his synonymy, to *subfasciatus*, Nyl.

20. *Halictus brevicornis*, Schenck.

Schenck, Jahr. Ver. Nat. Herz. Nassau, xxi., xxii., p. 310.

♂. Smaller than *villosulus*; face rather round, covered with white hairs in front. Mandibles, labrum, and apex of clypeus, yellow; extreme apex of mandibles pitchy. Antennæ short, only just reaching to the scutellum, pale beneath. Vertex and thorax sparingly clothed with greyish hairs. Mesothorax more closely punctured than in *villosulus*. Wings with the 2nd submarginal much wider than in that species. Metathorax radiately striate at the base. Abdomen short, dull, all the segments regularly punctured, the apical margins of the 3rd and following ones narrowly testaceous; beneath clothed with rather short hairs. Legs with the base and apex of the tibiæ, the front of the anterior tibiæ, and all the tarsi, yellowish white; (for genitalia see pl. ix., fig. 14.)

♀. Head finely and closely punctured, thorax very finely and remotely, its surface shining. Metathorax very finely and irregularly radiately striate at the base, shining on the actual brow. Abdomen with the basal segment shining, finely punctured, and hairy at the sides, disk glabrous and nearly impunctate; following segments closely and finely punctured, their apical margins widely testaceous, and their surface rather densely clothed with white hairs; the 2nd and 3rd segments with a little white lateral pubescence at the base. Legs clothed with pale greyish hairs; each segment of the abdomen beneath with a long fringe of greyish hairs. Length 5—6 mm.

Hab. I have taken the ♂ at Hayling Island and Bournemouth, but have not seen a British example of the ♀. I have described the latter sex from a continental specimen received from Mr. C. Ritzema.

Division V.

- (10) 1. Not very small; dorsal line of thorax in ♀ not deeply impressed; ♂ with the 1st segment of abdomen not very convex longitudinally; 2nd not much depressed at the base.
- (7) 2. 1st segment of the abdomen, at least on its apical half, and the 2nd and 3rd closely punctured, tarsi of ♂, whitish.
- (4) 3. Face very elongate in both sexes; 1st segment of abdomen dull, finely punctured all over; 2nd segment, in fresh examples, with a lateral line of white pubescence at base *punctatissimus*.
- (3) 4. Face shorter; 1st segment of abdomen polished and impunctate on the basal half.
- (6) 5. Face as long as wide; puncturation of thorax and abdomen very fine *nitidiusculus*.
- (5) 6. Face wider than long (♀); puncturation of thorax and abdomen coarser *breviceps*.
- (2) 7. 1st segment of abdomen very polished and shining, scarcely punctured at all, or at most only irregularly near the apex; 2nd and 3rd segments shining, irregularly punctured; ♂ tarsi dark or fuscous.
- (9) 8. Larger; face rather more elongate; abdomen more convex and ovate; ♂ tarsi testaceous-brown *atricornis*.
- (8) 9. Smaller; face less elongate; abdomen flatter, less ovate; tarsi of ♂ dark *minutus*.
- (1) 10. Very small; dorsal line of thorax in ♀ deeply impressed; ♂ with 1st segment of abdomen very convex longitudinally; 2nd much depressed at the base *minutissimus*.

21. *Halictus punctatissimus*, Schenck.

Schenck, Jahr. Ver. Nat. Herz. Nassau, ix., 1853, p. 147 = *longiceps*, E. Saund. = *porcus*, Mor. ?

This species may be known from all our other small black ones by the great length of the face.

♂. Head closely punctured. Apex of the clypeus, labrum, and mandibles pale yellow, tips of the last pitchy; face in front covered with white silvery hairs, in shape much longer than wide across the eyes. Antennæ pale beneath, reaching to about the base of the metathorax. Vertex, and thorax, especially round its sides, sparingly clothed with greyish hairs; mesothorax strongly and distinctly punctured; metathorax rather short, somewhat rounded posteriorly, longitudinally rugose at the base. Abdomen slightly shining, wider than

in most of the species of this group, rather largely and distinctly punctured on the first three segments, less distinctly on the following ones; beneath with a few long hairs across the 1st, 2nd, and 3rd segments, and some shorter ones on the 4th and 5th; (for genitalia see pl. ix., fig. 13). Legs with the tarsi pale whitish yellow; the extreme apex of the femora more or less testaceous.

♀. Head shaped much as in the ♂. Eyes very long and subparallel; face much longer than wide. Thorax deeply and distinctly punctured, its surface dull; metathorax as in the ♂. Abdomen with the 1st segment more shining than the rest, finely but not very closely punctured on its apical half; following segments closely punctured, and more or less densely clothed with greyish hairs; segments beneath fringed with long greyish hairs. Legs black, clothed with grey hairs; apices of the tarsi piceous. Length 6—7 mm.

Hab. Not rare. Wandsworth, Reigate, Chobham, Hastings, Southwold, Bournemouth, Norwich, &c.

22. *Halictus nitidiusculus*, Kirby.

Kirby, Mon. Ap. Angl. ii., p. 64; Smith, Cat. Brit. Hym., 2nd ed., p. 101.

♂. Black, but in certain lights with a very slight bronzy appearance; head much shorter than in the preceding, the antennæ longer, testaceous beneath; mandibles, labrum, and apex of clypeus yellow; mesothorax shining, very finely punctured; metathorax finely rugose at the base. Abdomen shining, elongate, very finely punctured; beneath shining, segments somewhat concave, sides of the segments with long tufts of white hair, which form a conspicuous and distinctive character; (for genitalia see pl. ix., fig. 16). Legs with the front of the fore tibiæ, the base and apex of all the tibiæ, and all the tarsi, pale yellow.

♀. Much like all the other females of this group, but with the testaceous margins of the abdominal segments generally very wide, and distinguishable by the very fine puncturation of the thorax and of the basal segment of the abdomen; these two characters together do not exist in any of our other species; in *punctatissimus* and *breviceps*, where the 1st segment of the abdomen is

punctured, the puncturation of the thorax is coarse; in *minutus*, *atricornis*, and *minutissimus* the 1st segment is impunctate or nearly so; *minutus* is its closest ally, but the thorax in that species is more shining, less closely and more largely and deeply punctured, and all the segments of the abdomen are less closely punctured, especially the 2nd and 3rd. Length 6 mm.

Hab. A common species, and generally distributed.

23. *Halictus minutus*, Kirby.

Kirby, Mon. Ap. Angl. ii., p. 61; Smith, Cat. Brit. Hym., 2nd ed., p. 100.

Deep shining black; ♂ with the apex of the clypeus, labrum, and mandibles pale. Antennæ beneath fulvous; head closely punctured in both sexes. Thorax shining, not so finely punctured as in *nitidiusculus*, and more remotely. Wings with the nervures pitchy brown. Metathorax rounded posteriorly, longitudinally rugose at the base. ♂ with the abdomen very shining; basal segment finely and rather remotely punctured on its apical half; following segments punctured at the base, impunctate towards the apex; surface with a few scattered short white hairs, beneath with the segments without fringes or lateral tufts of hair; (for genitalia see pl. ix., fig. 17). Legs black; tarsi piceous, paler towards the apex.

♀. 1st segment of abdomen very shining, with a few shallow punctures towards the apex; following segments irregularly and remotely punctured, apical margins of the segments scarcely discoloured, surface sparsely clothed with greyish hairs. Legs with grey hairs. Length 6 mm.

Hab. Not common; Chobham, Shere, &c. ♀ probably often mistaken for *nitidiusculus*, and *vice versâ*.

24. *Halictus breviceps*, E. Saund.

E. Saund., Ent. Mo. Mag. xv., p. 200.

♀. Easily distinguished from its allies by its short wide head, which is much wider across the eyes than long, its largely and deeply punctured thorax, and the testaceous nervures of its wings. The basal segment of the abdomen is very shining, but punctured at its apex,

and all the following segments are punctured, their apical margins widely testaceous. Length 6 mm.

Hab. Chobham, Shere, Hayling Island, &c.

I do not know the ♂ of this species.

25. *Halictus atricornis*, Smith.

Smith, Ent. Ann., 1870, p. 26; Cat. Brit. Hym., 2nd ed., p. 100.

Very like *minutus*, but larger, differing in the following particulars:—

♂. With the puncturation of the thorax less regular and rather stronger; the brow of the metathorax not so smooth and shining, and rather more largely rounded. Abdomen very polished; the puncturation at the base of the 2nd and following segments much less close and shallower, that of the basal segment scarcely observable; tarsi paler. Genitalia very distinct, each apex of the stipites being produced into two elongate processes (see pl. ix., fig. 19); whereas in *minutus* the outer process is turned backwards under the body of the stipites.

♀ with the face longer than in *minutus*, the mesothorax more convex, the metathorax more widely rounded, as in the ♂, the abdomen much more convex and ovate, the margins of the segments almost concolorous; 1st segment with scarcely visible punctures; the 2nd and following with an extremely fine puncturation at the base; sides and apex of the abdomen with a few greyish hairs. Legs with greyish yellow hairs. Length $6\frac{1}{2}$ — $7\frac{1}{2}$ mm.

Hab. Cheshire (B. Cooke). I know of no other locality.

26. *Halictus minutissimus*, Kirby.

Kirby, Mon. Ap. Angl. ii., p. 63; Smith, Cat. Brit. Hym., 2nd ed., p. 102.

♂. Black; the extreme apex of the clypeus white; mandibles piceous. Antennæ reaching to the base of the metathorax, piceous beneath; mesothorax dull, strongly punctured; metathorax rather long, finely rugose at the base, shining and polished beyond the rugosities. Abdomen largely and distinctly punctured

on all the segments; basal segment very convex, narrowly and deeply impressed at the apex; 2nd segment depressed at the extreme base, then very convex and impressed again at the apex, which is pale and somewhat membranous; 2nd and following segments clothed with greyish hairs; segments beneath fringed with whitish hairs; (for genitalia see pl. ix., fig. 20). Legs entirely black, clothed with greyish hairs.

♀. Narrower than any of the preceding species; face rather elongate; mesothorax largely punctured, with a very deep dorsal line in front; metathorax rugose at the base, but not shining at the apex as in the ♂; basal segment of abdomen very shining, with a few scattered punctures; 2nd and following closely punctured, and clothed with greyish hairs; segments beneath with long hairs. Legs clothed with greyish yellow hairs. Length 5—5½ mm.

Hab. Common and generally distributed.

The small size and narrow form of the ♀ readily distinguish it from its allies; the ♂ is abundantly distinct by its black tarsi and the shape of the 1st and 2nd abdominal segments.

Division VI.

- 4) 1. Tibiæ and tarsi of ♂ yellow; ♀ with the abdomen densely hairy, with paler apical bands to the segments.
- (3) 2. Hairs of the thorax in ♀ fulvous; pubescence of head and thorax very dense. ♂; antennæ not nearly so long as body *gramineus*.
- (2) 3. Hairs of thorax in ♀ whitish; pubescence of head and thorax not dense. ♂; antennæ as long as body *tumulosum*.
- (1) 4. Tibiæ of ♂ not yellow; ♀ with the abdomen not densely hairy; no pubescent apical bands to the segments.
- (6) 5. Abdomen with a bright æneous tinge *Sneathmanellus*.
- (5) 6. Abdomen black, or nearly so.
- (8) 7. ♂ tarsi black; surface of thorax in both sexes not very shining; the intervals between the punctures, under a strong power, seen to be finely rugose or scratched; face subelongate *morio*.
- (7) 8. ♂ tarsi whitish; surface of thorax in both sexes shining, and quite smooth between the punctures; face subrotundate *leucopus*.

27. *Halictus tumulorum*, Linn.

Linn., Syst. Nat., ed. x., i., p. 574; Smith, Cat. Brit. Hym., 2nd ed., p. 94.

Bronzy green; head finely and closely punctured.

♂. With the apex of the clypeus, mandibles, and labrum pale yellow. Antennæ very long, extending almost to the 2nd abdominal segment, pale beneath; face covered with grey hairs; mesothorax rather largely and closely punctured; metathorax rounded posteriorly, rugose at the base. Abdomen elongate, strongly and closely punctured; 1st segment impressed at the apex; 2nd and 3rd much impressed at the base, apical margins more or less testaceous and impunctate; each segment has a slight apical band of pale hairs; beneath with the 5th segment deeply emarginate; the 6th subtruncate at the extremity, and with a small basal fovea; (for genitalia see pl. ix., fig. 6). Legs pale yellow.

♀. Head and thorax punctured as in the ♂. Antennæ fulvous beneath towards the apex; metathorax somewhat truncate posteriorly. Abdomen closely punctured, clothed with slightly golden hairs; the base of the 1st segment at the sides, a band at its apex, a band at the base and apex of the 2nd and 3rd, and a band at the apex of the 4th, covered with white hairs; 5th segment covered with golden hairs at the apex, on each side of the central rima; 6th with the dorsal valve narrow and testaceous, carinated and raised at the base, with long golden hairs at the sides of the valve; segments beneath with long greyish hairs. Length 7 mm.

Hab. Common and generally distributed.

28. *Halictus gramineus*, Smith.

Smith, Zool. vii., App. 58; Cat. Brit. Hym., 2nd ed., p. 95.

Easily distinguished from the preceding by the short antennæ of the ♂, which reach only to about the middle of the metathorax, and the bronzy femora, and by the dense pubescence of the ♀, which is of a golden, almost fulvous, tinge; the tegulæ and nervures of the base of the wings are pale yellow, and the anterior tibiæ in front, and the base of the others, and all the tarsi, are more or less flavous. Length 6—7 mm.

Hab. A very rare species in England, and very distinct; the only recorded localities are Cove Common, Hants, and Devonshire. It is not rare in the South of Europe.

29. *Halictus Smeathmanellus*, Kirby.

Kirby, Mon. Ap. Angl. ii., App., p. 375; Smith, Cat. Brit. Hym., 2nd ed., p. 95.

Head and thorax bright bronzy green. Abdomen with a distinct bronzy green tint.

♂. Head and thorax bronzy green; head closely punctured, dull. Clypeus with a white spot at the apex. Antennæ pale beneath, reaching to the apex of the meta-thorax. Mesothorax shining, rather irregularly punctured, and clothed with scattered white hairs; the surface between the punctures bright and smooth. Meta-thorax rugose, somewhat rounded posteriorly. Abdomen elongate, bronzy or greenish black; abdomen very shining and polished, with the base of each segment punctured, the apex almost impunctate; in the impressions at the base of the 2nd and 3rd segments is a white pubescent band; (Kirby must have described from a rubbed specimen, as he particularly notices the absence of these bands); beneath clothed with long white hairs; (for genitalia see pl. ix., figs. 5a, 5b). Legs entirely black.

♀. Of a brighter colour than the ♂; the whole insect, except the legs and antennæ, being generally of a bright bronzy colour, the head and thorax rather more golden. Head rather elongate, dull, finely and closely punctured. Thorax shining, punctured, &c., as in the ♂. Abdomen shining, punctured at the base of the segments, narrowly testaceous at the apex; 2nd and 3rd with a white basal band of pubescence; 3rd and following clothed with scattered hairs, beneath with long hairs. Legs black, clothed with pale hairs. Apical joint of the tarsi more or less pitchy. Length 6—6½ mm.

Hab. Common in many places. Hastings, Bourne-mouth, London district, Norwich, Lowestoft, &c.

A very distinct species, easily known by its shining surface and bright brown-green abdomen.

30. *Halictus morio*, Fab.

Fab., Ent. Syst. ii., p. 306; Smith, Cat. Brit. Hym., 2nd ed., p. 97, var. = *ceratus*, Kirby, Smith, &c.

♂. Head and thorax bronzy green, the former closely punctured, with the clypeus considerably produced, with

a white spot near the apex. Antennæ black, pale beneath, reaching to about the apex of the metathorax. Mesothorax dull, rather closely punctured, the intervals between the punctures very finely rugose. Metathorax rugose, rounded posteriorly. Abdomen black; segments rather strongly punctured, except at their extreme apices; 2nd and 3rd with a lateral basal spot of white pubescence, their basal region scarcely impressed; ventral hairs very short; (for genitalia see pl. ix., fig. 2). Legs black, clothed with short greyish hairs.

♀. Head and thorax dull, punctured, &c., much as in the ♂; face as long as wide across the eyes. Metathorax somewhat rounded posteriorly, rugose at the base. Abdomen black, shining, especially the basal segment, which has only a few scattered punctures; the following segments are more closely and finely punctured, and clothed with pale pubescence; the 2nd and 3rd with a lateral basal spot of white pubescence; segments beneath with long whitish hairs. Legs black, clothed with pale hairs. Length 6—7 mm.

Hab. Very common; the ♂ very variable in size. I feel sure that *æratus* is only a small variety.

31. *Halictus leucopus*, Kirby.

Kirby, Mon. Ap. Angl. ii., p. 59; Smith, Cat. Brit. Hym., 2nd ed., p. 97.

♂. Head and thorax bright bronzy green. Clypeus pale at the apex; labrum and mandibles yellow, the latter rufescent at the apex. Antennæ short, not quite reaching to the scutellum, pale beneath. Mesothorax shining, rather coarsely punctured. Metathorax somewhat rounded posteriorly, rugose at the base. Abdomen black; segments punctured at the base, very smooth and shining at the apex, under side with very short hairs; (for genitalia see pl. ix., fig. 3). Legs black; base and apex of each of the tibiæ, and all the tarsi, pale yellowish.

♀. Exceedingly like *morio*, but differing in having the face much wider, it being decidedly wider across the eyes than long, the thorax more shining, the punctures rather larger, and the intervals between them smoother; the metathorax is rather more rugose, and more widely

rounded posteriorly, and the abdomen has no white lateral spots. Length 5—6 mm.

Hab. Not rare. London district, Norwich, Lowestoft, Southwold, Littlehampton, Bournemouth, Tunbridge Wells, Reigate, Chobham, &c.

The ♂ is very distinct from any other species.

ANDRENA, *Fab.*

Fab., *Syst. Ent.*, p. 376. For figures of generic characters see *F. Smith*, *Cat. Brit. Hym.*, 2nd ed., pl. vi.

Tongue lanceolate; paraglossæ not acute; labial palpi 4-jointed; maxillary palpi 6-jointed. Anterior wings with three submarginal cells. ♂ generally with the head wider than that of the ♀, the vertex often subquadrate; in some species with the head enormously enlarged, and the mandibles long and falcate; the size of the head, however, varies very much amongst specimens of the same species. Clypeus sometimes white. Abdomen generally narrower than in the ♀, and with the 8th or apical ventral plate narrowed and elongate towards the apex, generally somewhat dilated at the extremity, and often emarginate; the 7th ventral plate hidden in nearly all the species under the 6th; the genitalia of the males of the different species bear a very strong general resemblance to one another, and in this respect the genus contrasts curiously with *Habictus*, *Prosopis*, &c., where the genitalia of each species give such characteristic distinctions. ♀ with the abdomen usually ovate, sometimes nearly glabrous, but generally either clothed all over with long hairs, or else banded with pale hairs at the apex of the segments; 5th and 6th segments densely clothed with hairs, which are often of a different colour to those on the rest of the abdomen. Apical dorsal valve with its centre glabrous, the glabrous portion of a triangular shape; posterior legs of the ♀ with a tuft of curled hairs on the trochanters, generally called the "floccus;" this in many species is composed of very long hairs, and forms a prominent character; the posterior tibiæ are outwardly clothed with long hairs, which form the "scopæ," and on their inner surface, or that towards the body, they are clothed with hairs, having flattened and dilated apices, so formed probably for cleaning purposes. At the base of the tibiæ is a

glabrous flattened disk called the "patella"; this in some of the species is very prominent, and projects so as to look like a tooth if viewed sideways. The basal joint of the posterior tarsi is elongate and dilated, and covered with bristly hairs.

The most important structural characters in the ♂ seem to be found in the labrum, the clypeus, the antennæ, especially in the relative lengths of their 2nd, 3rd, and 4th joints, the puncturation, and the form of the 8th or terminal ventral segment; in the ♀ the characters seem chiefly to lie in the shape of the face, the puncturation, and the sculpture of the dorsal portion of the 6th segment.

The colour of the pubescence, &c., also affords good characters, but exposure to the weather greatly alters the general look of the insects, and the colour rapidly fades. The little parasite *Stylops*, so well known to hymenopterists, is often the cause of considerable variation in these insects; its presence may generally be detected by the deformed appearance of the bee's body, or by the actual protrusion of a portion of its own body from between the segments of that of the bee; it projects something like a small brown seed more or less flattened, and the variations caused by its presence are well worthy of notice. I have to thank Professor Perez, of Bordeaux, for some very interesting remarks on this subject.

If a ♂ be styloped, its general appearance becomes more like that of a ♀; if a ♀ be styloped, it becomes more like a ♂: thus, in the case of a ♂, its head tends to become smaller, the pubescence of the abdomen to become denser and paler, and to form bands at the apices of the segments, the legs to become more densely hairy, and in the species where the clypeus is white it tends to become black or spotted; in the case of a ♀ the head tends to become smaller, as in the ♂, the scopæ to become less dense and paler, as also the pubescence of the body, but like as in the ♂ it tends to form pale bands at the apices of the segments, and in species where the ♂ has the clypeus white, the styloped ♀ often has that part white also or spotted with white; there also seems to be a tendency in both sexes to assume a somewhat pallid, immature appearance. The effects of stylopedisation vary very much in different specimens, some hardly showing any variation from the typical form, others varying to such an extent as to be hardly

recognisable. From the nature of these variations it would appear probable that the genital organs are in some way injured by the parasite while the insect is in the larval state. Up to the present time as many as five so-called species have existed in our list whose characters depend entirely, as far as I can see, on the effects of stylopisation, viz., *Mouffetella*, Kirby, = *atriceps* ♂; *picipes*, Kirby, and *picicornis*, Kirby, both of which = *Trimmerana* ♂ and ♀; *Aprilina*, Smith, = *nigro-cenea* ♂; and *convexiuscula*, K., = *Afzeliella*.

There can be, I think, little doubt that many of our species are double-brooded, the first brood appearing about the end of March or in April, the second appearing in July or August; in some cases the two broods resemble one another almost exactly, as in *pilipes*, *thoracica*, *fulvicrus*, and *Afzeliella*; in others the males are pretty easily distinguishable by various characters of colour, pubescence, &c.; whereas the females are almost exactly alike. This difference in the males has caused entomologists to consider the two broods as representing two distinct species; thus, *bimaculata* and *decorata*; *Gwynana* and *bicolor*; *parvula* and *minutula*; *dorsata* and *combinata*: all, I believe, belong to species which have a spring and autumn brood; and this view, I think, receives support from the fact that in the localities where the spring form occurs the autumn form is found also; that there should be a slight difference between the two broods does not seem to be unnatural, as the food supplied to the larvæ in each case must almost necessarily be different; as a rule, the species which frequent the willow in the early spring frequent the flowers of *Rubus* in the summer.

The bees of this genus, as a rule, form colonies of greater or less extent either in hedge-banks or pathways, or other exposed surfaces of earth; and consequently, in most cases, if one specimen is met with, others are sure to be found near the same spot; the males, however, do not always occur with the females: for instance, the female of some species may be abundant on the flowers of a willow-bush; the males very likely will be seen coursing up and down the hedge under the willow, or just above the ground if their colony is close by; the males also seem to come out earlier and stay out later than the females, and they may often be found flying about as late as 5 or 6 o'clock. Mr. F. Smith has given such an excellent account of the general habits, &c., of these

insects in his last book,* that I do not think I need do more than refer to his remarks, which will be found at the commencement of his description of the species of *Andrena* (p. 21). I have in some cases changed the names which have hitherto been used, taking always the first name given to the species, whether the description is from a ♂ or ♀.

Care should be taken not to mistake the yellow of the pollen on the scopæ for the real colour of the hairs themselves.

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|-----|---|-----------|
| (2) | 1. Abdomen in both sexes generally more or less red, at least beneath; or large, with the wings brownish. ♂, clypeus white; ♀, anal fringe golden | Div. I. |
| (1) | 2. Abdomen black, or sometimes more or less red; but in the latter case with the clypeus in the ♂ black, and the anal fringe of the ♀ dark. | |
| (4) | 3. Metathorax with its basal area largely and coarsely clathrate, bounded posteriorly by a raised line | Div. II. |
| (3) | 4. Metathorax with its basal area smooth, or punctured, or finely rugose; rarely finely clathrate; not bounded posteriorly by a raised line. | |
| (6) | 5. ♂ larger or medium-sized, without distinct, pale pubescent bands at the apices of the abdominal segments; clypeus not white; tibiæ entirely dark (except in <i>Clarkella</i> , where they are sometimes pale at the apex). ♀ large, with dark brown or black apical fringe; abdomen often densely hairy; or medium-sized, without either distinct clearly defined apical bands of pale pubescence, or lateral white streaks to the abdominal segments; apical fringe always dark; tibiæ always dark (except in <i>Clarkella</i>), although sometimes clothed with golden hairs. | Div. III. |
| (5) | 6. ♂ with distinct abdominal bands; or very small; or with the clypeus white; or with the tibiæ more or less pale. ♀ large, with golden apical fringe (<i>labialis</i>); or medium sized, with golden apical fringe; or if with dark apical fringe, then with distinct, well defined, pale apical bands, or white lateral streaks to the abdominal segments; or entire insect very small; tibiæ often pale and translucent. | |
| (8) | 7. ♂, head very large. ♀ with the mandibles produced into a membranous wing beneath; abdominal segments testaceous at the apex .. | Div. IV. |
| (7) | 8. ♂, head of normal size. ♀, mandibles simple; abdominal segments not testaceous at the apex. | |

* Catalogue of British Hymenoptera in the British Museum, 2nd ed., pt. 1. Andrenidæ and Apidæ. 1876.

- (10) 9. ♂ with the abdominal pale bands entire; or if interrupted, then with the basal area of the metathorax defined by a smoother line at the sides and apex, and the mandibles long and falcate; clypeus black; tibiæ entirely dark. ♀, bands of abdomen entire Div. V.
- (9) 10. ♂ with one or more of the abdominal bands, when present, interrupted; basal area of metathorax not defined by a smoother line at the sides and apex, often undefined altogether; clypeus sometimes white; tibiæ in some species more or less pale. ♀, pubescent bands of the abdomen, when present, interrupted as in the ♂.
- (12) 11. Abdomen polished and shining Div. VI.
- (11) 12. Abdomen not polished and more or less dull, either from the closeness of the puncturation or from the fine rugulosities of the surface between them Div. VII.

Division I.

- (2) 1. Large; wings more or less brown; abdomen shining, finely and remotely punctured *Hattorfiana*.
- (1) 2. Medium sized; wings almost clear; abdomen dull, except the 1st segment, and closely punctured.
- (4) 3. 2nd and 3rd segments of abdomen with a pale apical band of hairs *Cetii*.
- (3) 4. 2nd and 3rd segments of abdomen naked at the apex *cingulata*.

1. *Andrena Hattorfiana*, Fab.

Fab., Syst. Ent., p. 389 (*Nomada*); Smith, Cat. Brit. Hym., 2nd ed., p. 26.

Large, black, shining; ♀ often with the abdomen more or less red; wings brown.

♂. Clypeus white, with a small black dot on each side; apical margin looked at from above truncate, black; antennæ short, scarcely longer than those of the ♀; vertex rugosely punctured, clothed like the face with greyish hairs; mesothorax shining, punctured, covered with grey hairs; metathorax dull, very rugosely punctured and hairy. Abdomen shining, sparsely punctured, the apical margins of the segments widely piceous and somewhat impressed. Apex clothed with golden hairs; segments beneath fringed with golden hairs; (for genitalia see pl. xi., fig. 5). Legs with the tarsi more or less testaceous.

♀. Larger than the ♂. Clypeus black; each side of the face with a line of pale pubescence, and a slight

depression near the inner margin of the eye, filled with very short shining adpressed hairs. Thorax much like that of the ♂, but less hairy, and the metathorax rather more rugose. Abdomen shining, sometimes black as in the ♂, sometimes with the 1st and 2nd segments and apical margin of the 3rd, ferruginous-red; the base of the 1st and 2nd generally black; between these forms great variation occurs. Surface very finely punctured; 2nd, 3rd, and 4th segments with a lateral streak of whitish hairs; 5th and 6th clothed densely with golden hairs; segments beneath fringed with long hairs. Legs black; tarsi more or less testaceous; tibiæ clothed with long golden grey plumose hairs. Length 14—16 mm.

Hab. Ventnor; Erith, Darent, Birch Wood, Kingsdown near Walmer, Kent; Teignmouth and Dawlish, Devon; and S. Wales. It is found chiefly on the common Scabious, according to F. Smith, and the high coloration of the ♀ he thinks depends upon the dryness or heat of the season, as in hot dry summers he has found nearly all the females coloured.

2. *Andrena Ceti*, Schrank.

Schrank., Enum. Ins. Austr., p. 405; Smith, Cat. Brit. Hym., 2nd ed., p. 31.

♂. Black, shining; head deeply emarginate posteriorly, wider than the thorax, clothed with grey hairs. Clypeus white; apical margin and two small discal spots black, deeply emarginate in front, with a raised tooth on each side of the emargination; labrum tuberculated, the tubercle filling up the emargination of the clypeus, and deeply impressed in front. Mandibles red at the apex. Thorax shining, punctured, clothed with rather long grey hairs; nervures of the wings pitchy brown; metathorax rounded, finely rugose. Abdomen shining, finely punctured, brownish black, the apical margins of the segments piceous; 5th, 6th, and 7th segments above clothed with white hairs at the apex; beneath with the 3rd, 4th, and 5th segments beautifully and densely ciliated at the apex, the ciliæ in the middle of each segment much shorter than the outer ones; 6th and apical segment densely hairy; (for genitalia see pl. x., figs. 4, 4a). Legs covered with long grey hairs.

♀. Head and thorax black, clothed with short

brownish grey hairs. Clypeus black, largely punctured; vertex and face, above the clypeus, rather more finely and closely. Thorax finely and closely punctured; pubescence beneath the wings and round the sides greyish white; wings somewhat smoky; metathorax finely rugose. Abdomen with the basal segment black, except at the apex, shining and rather remotely punctured, with a few scattered hairs; the other segments entirely pale yellow or brown, with the apical margins only pale, dull, very closely and finely punctured, and clothed with very short pale decumbent hairs, and with an apical band of longer hairs; 5th segment covered with long hairs which are bright golden at its apex, 6th with bright golden hairs, the central naked portion flat and triangular; beneath with the 3rd and following segments ciliated at the apex. Legs: femora clothed with long white hairs; tibiæ and tarsi with brown hairs, posterior tibiæ with the scopæ dense and brown, the inner side of the tibiæ nearest the body with long white hairs. Length 9—10 mm.

Varies greatly in colour, one or more of the apical segments often being fuscous, and the intermediate segments yellow.

Hab. A local and generally rare species. Kingsdown, near Deal, Croydon, Dartford, Lewes, Norwich, Parley Heath, Hants, and Coombe Martin, North Devon. I have never taken this species myself; it occurs on the wild scabious in July and August.

3. *Andrena cingulata*, Fab.

Fab., Syst. Ent., p. 390 (*Nomada*); Smith, Cat. Brit. Hym., 2nd ed., p. 32.

Head and thorax black, clothed with whitish hairs, the pubescence in the ♂ longer than in the ♀; vertex of the head, and face above the antennæ very closely punctured. Clypeus largely punctured, white in the ♂, with the apical margin narrowly and two small discal spots, black; the face at the sides of the clypeus also white in this sex. ♀ with a line of short velvety pubescence near the inner margin of the eye. Antennæ fulvous beneath, towards the apex, in both sexes. Mesothorax slightly shining, punctured. Metathorax finely rugose. Abdomen closely punctured, the basal segment, except the extreme apex, and the 4th and following segments, except a spot on

each side of the base of the 4th, black, the remainder bright red; 4th and following segments with an apical fringe of pale hairs; those of the 5th and 6th in the ♀ brownish, and the 6th and 7th in the ♂ more or less golden; segments beneath with pale apical fringes. Legs in the ♂ with white hairs, in the ♀ with brown, scopæ dense and brown. Length 8—9 mm.

Hab. Not uncommon, in the summer, on *Veronica chamædrys*. There is no other species of the genus with which it can be confounded, and the ♂ and ♀ in shape are almost exactly alike.

Division II.

- (2) 1. Apex of abdomen golden in both sexes *albicans*.
 (1) 2. Apex of abdomen dark in both sexes.
 (4) 3. Entire insect black; hairs of thorax in ♂ and hairs on under side of scopæ in ♀ alone pale.. *pilipes*.
 (3) 4. Head and thorax clothed with brown hairs; abdomen with pale hairs.
 (6) 5. ♂, abdomen dull, not shining; immaculate beneath; genitalia very large; apex of tibiæ generally pale. ♀, posterior tibiæ clear testaceous; clothed with golden hairs *atriceps*.
 (5) 6. ♂, abdomen more or less shining, sometimes spotted with red on the 2nd segment; genitalia small; tibiæ black. ♀, posterior tibiæ black, clothed with pale yellowish hairs *bimaculata*.

4. *Andrena albicans*, Kirby.

Kirby, Mon. Ap. Angl., ii., p. 94; Smith, Cat. Brit. Hym., 2nd ed., p. 37.

♂. Black; face, legs, and sides of the thorax below the wings and apex of the abdomen clothed with golden brown hairs; mesothorax with the hairs darker and of a redder brown; 6th segment above testaceous at the apex; intermediate tarsi and posterior tibiæ and tarsi testaceous, except a more or less extended black spot on the tibiæ, which occurs in many varieties.

Head closely punctured, about as wide as the thorax; antennæ entirely black, reaching to about the apex of the metathorax. Mesothorax closely and coarsely punctured; metathorax with a well defined clathrately rugose basal area, sides of the metathorax beyond it finely rugose, and densely hairy. Abdomen shining, strongly and rather closely punctured; apical portions of the 2nd and

following segments impressed; segments beneath punctured, fimbriated at the apex.

♀. Black; thorax and apex of the body clothed with bright red hairs; intermediate tarsi and posterior tibiæ and tarsi clear testaceous, densely clothed with golden hairs.

Head deeply and closely punctured; face with white hairs, and a line of velvety pale pubescence near the inner margin of each eye. Mesothorax largely and closely punctured, but so densely covered with hairs that the puncturation is seen with difficulty. Metathorax with a well defined basal area, as in the ♂. Abdomen slightly shining, strongly punctured; 1st, 2nd, and 3rd segments glabrous or nearly so, except at the sides; 5th and 6th densely clothed with golden-red hairs; 6th with the disk of the glabrous central portion triangularly raised; segments beneath punctured, with pale apical fringes. Length 10—11 mm.

Hab. Very common in April and May, and generally distributed; it is one of quite the early spring bees; the ♀ is distinct from any other species by the bright red apex of the abdomen; the ♂ is like several others in general appearance, but the testaceous apex of the abdomen and the clear yellow tibiæ in most cases will distinguish it; while the clathrate basal area of the metathorax and the strongly punctured abdomen are unfailing structural characters.

5. *Andrena pilipes*, Fab.

Fab., Species Ins., i., p. 474; Smith, Cat. Brit. Hym., 2nd ed., p. 34.

Black, clothed with black hairs; pubescence of the thorax in the ♂ griseous, and the hairs on the under side of the posterior femora and the outside of the scopæ in ♀ white. Wings smoky brown, with their apical margins darker.

Head and thorax rugosely punctured in the ♂, the latter rather more remotely in the ♀. Face of the ♂ very densely covered with long black hairs. Clypeus in the ♀ strongly and rugosely punctured. Metathorax in both sexes with a triangular clathrate inclosure at the base. Abdomen subelongate in the ♂, suboval in the ♀, rather irregularly and rugosely punctured; apex of each segment, except the 1st, impressed,

the impressed portion punctured; 5th and 6th in the ♀, and 6th and 7th in the ♂ densely covered with black hairs; beneath, the segments of the ♂ are shining, of the ♀ dull and densely punctured. Length 12—15 mm.

Hab. Not common; appearing sometimes as early as April, and found in August on flowers of *Rubus*, thistles, &c. Southend, Darenth, Shirley Common, Sidmouth, Norwich, Hastings, Chobham, Bourne-mouth, &c.

I do not think this species can be confounded with any other. Much worn specimens of the ♂ of *thoracica* sometimes rather resemble it, but the enclosed clathrate space on the metathorax and the punctured apical impressions of the abdominal segments will distinguish the present species easily.

6. *Andrena atriceps*, Kirby.

Kirby, Mon. Ap. Angl., ii., p. 70; Smith, Cat. Brit. Hym., 2nd ed., p. 43. Stylopized ♂ = *Mouffetella*, Kirby.

Thorax clothed with brown hairs. Face in the ♂ with brown mixed with black, in the ♀ with whitish, hairs. Abdomen clothed with pale hairs. Both sexes with a clathrate enclosure at the base of the metathorax. ♀ with the posterior tibiæ and tarsi clear testaceous. Scopæ golden.

♂. Head punctured and longitudinally strigose above the antennæ; face densely clothed with brown hairs, more or less mixed with black. Mandibles simple at the base. Antennæ reaching not quite to the apex of the metathorax. Thorax densely clothed with rather pale brown hairs; mesothorax irregularly and deeply punctured; metathorax clathrately rugose at the base. Abdomen elongate-ovate, rather densely clothed with upright pale hairs; the hairs of the 5th and 6th segments mixed with black; each segment, except the 1st, impressed at the apex, and with a very narrow apical band of slightly paler hairs; apical segment clothed with brown hairs. Surface finely punctured, scarcely shining. Beneath with posterior margins of the segments narrowly testaceous, fringed with longish hairs; genitalia very large. Legs black; the tibiæ of the posterior pair generally more or less testaceous towards the apex (but this is not a constant character); tarsi testaceous.

♀. Generally larger than the ♂, and, as in other species of the genus, wider. Face clothed with pale greyish pubescence more or less mixed with black at the extreme sides. Thorax punctured as in the ♂, but clothed, in fresh examples, with bright brown hairs on the mesothorax and scutellum, and paler hairs round the margins. Metathorax with a well-defined basal area, largely clathrate within, and bounded by a raised line. Abdomen shining, black, punctured, clothed with short, somewhat adpressed, ochreous-grey hairs, apical fimbria black; the glabrous exposed portion of the apical segment slightly and triangularly raised and rugose in the middle, round the edges shining and smooth. Segments beneath each with a slight central longitudinal depression, strongly punctured, with pale apical fimbria; posterior femora clothed with white hairs, floccus white; posterior tibiæ and tarsi clear testaceous, clothed with golden hairs. Length 13—15 mm.

Hab. A very common species in the spring.

Mouffetella, K., is a stylopized var. of the ♂. This species is most closely allied to *bimaculata*, but the clear testaceous hind tibiæ of the ♀, and the dull densely clothed abdomen and the large genitalia of the ♂, will readily distinguish it. The sectional character of the rugose basal area of the metathorax will at once separate it from *nigro-ænea* and others of that group with which it has a strong general resemblance.

7. *Andrena bimaculata*, Kirby.

Kirby, Mon. Ap. Angl. ii., p. 115; Smith, Cat. Brit. Hym., 2nd ed., p. 47 = *decorata*, Smith = *vitrea*, Smith.

Black; face clothed with sooty hairs, or brown hairs with sooty hairs mixed. Thorax with brown hairs. Metathorax with an enclosed rugose basal area. Abdomen in both sexes often with two dull red spots on the 2nd segment beneath; ♀ often with the apex of the basal segment, and sometimes of the 2nd, red above. Scopæ of ♀ with pale yellowish hairs. Legs of ♂ entirely black.

♂. Head deeply punctured, and densely covered on the face with long black hairs, or in some varieties with brown hairs mixed with black. Mandibles simple at the base. Antennæ reaching to not quite the apex of the

metathorax. Thorax clothed with dull greyish brown hairs. Mesothorax strongly punctured. Metathorax largely and clathrately rugose at the base. Wings clear, with a slight cloud along their apical margins, nervures pale. Abdomen somewhat elongate and rather shining, finely punctured, clothed with short greyish hairs; basal and following segments impressed along their apical margins, the impressions bearing rather denser bands of pale hairs, apical fimbria golden brown. Segments beneath finely and remotely punctured, fringed with long hairs, and ciliated with fine and very short hairs at their apical margin. Legs entirely black, clothed with greyish brown hairs.

♀. Head clothed with dark sooty or brown hairs, longitudinally strigose, and punctured above the antennæ. Thorax clothed with brown hairs, strongly punctured. Metathorax as in the ♂, the basal area triangular, enclosed by a well-defined raised line. Abdomen ovate, shining, finely and irregularly punctured, clothed somewhat sparingly with rather long pale hairs; 5th and 6th segments densely with black hairs. Apical portions of all the segments impressed; glabrous portion of the 6th dorsal segment raised in the centre; beneath finely and closely punctured, segments with long hairs, and with fine short apical ciliations. Legs clothed with black-brown hairs. Scopæ pale fulvous-brown. Length 13—16 mm.

Hab. Local but not rare in some places. Norwich and Chobham (spring brood); Norwich, Southwold, Bournemouth, Sidmouth, Shirley, and Windsor (autumn brood).

I have not the slightest doubt that these three so-called species are varieties of one. *Bimaculata* appears in April, and is taken, like most of the other spring bees, on sallows. *Decorata* and *vitrea* appear in August, and are taken on *Rubus*. The only character I know by which the autumn brood (*decorata*) can be known from the spring brood (*bimaculata*) is the paler pubescence of the face, and the want of the two spots on the 2nd abdominal segment beneath in the ♂, but as the ♀ differs greatly in both broods as to colour, the constancy in this respect of the ♂ of one brood does not seem to me sufficient for a specific character. I have sent specimens to Professor Perez, of Bordeaux, who tells me that

the species occurs there (also double-brooded), and that he has always considered them identical; *vitrea* is only a narrower form of the autumn brood; (for its affinities with *atriceps* see notes on preceding species).

Division III.

- (6) 1. ♂; abdomen more or less red, or at least with the apical margins of the segments pale; in one species with the cheeks spinose or angulated at the base of the mandibles; mandibles simple; antennæ in some, reaching to the apex of the metathorax. ♀; abdomen more or less red at the base, or with the apical valve simple, not triangularly raised in the centre; segments with paler hairs at the apex; scopæ dark brown.
- (3) 2. ♂; antennæ short, not reaching beyond the scutellum. ♀; abdomen strongly punctured *florea*.
- (2) 3. ♂; antennæ reaching to the apex of metathorax. ♀; abdomen finely rugulose, not strongly punctured.
- (5) 4. ♂; apical ventral valve entire; cheeks simple. ♀; dorsal valve not punctured *rosæ*.
- (4) 5. ♂; apical ventral valve deeply emarginate; cheeks angulated or spinose. ♀; dorsal valve deeply punctured *Triummerana*.
- (1) 6. ♂; abdomen without red or pale markings; antennæ not reaching to the apex of the metathorax; cheeks simple; mandibles often toothed at the base. ♀; abdomen without red markings, shining, polished, or densely clothed with long hairs, or, if with paler apical bands, then with the apical dorsal valve triangularly raised in the centre.
- (12) 7. Species large; abdomen blue-black or deep black, polished and shining in both sexes; mandibles simple in ♂; tarsi, at least the basal joint, black; scopæ of ♀ black.
- (9) 8. Abdomen blue-black *cineraria*.
- (8) 9. Abdomen deep black.
- (11) 10. Face and under side with black hairs *thoracica*.
- (10) 11. Face and under side with white hairs *nitida*.
- (7) 12. Species large or medium-sized; abdomen not polished and shining, except in some smaller species; mandibles often dentate in the ♂; scopæ of ♀ black, brown, or fulvous.
- (16) 13. ♂ with a narrow basal mandibular tooth, or with the 3rd joint of the antennæ as long as the 4th and 5th together. ♀; abdomen densely clothed with red or black hairs.
- (15) 14. ♂; mandibles toothed at the base. ♀; abdomen clothed with fulvous-red hairs *fulva*.
- (14) 15. ♂; mandibles simple. ♀; abdomen clothed with black hairs *Clarkella*.

- (13) 16. ♂; mandibles simple or with a wide triangular basal tooth; 3rd joint of the antennæ not nearly so long as the 4th and 5th together. ♀ with the abdomen not densely clothed either with red or black hairs.
- (22) 17. ♂; mandibles simple; face clothed with black or brown hairs. ♀; scopæ fulvous or golden.
- (21) 18. Posterior tibiæ in ♀ dark, with fulvous hairs.
- (20) 19. Species large; face in ♂ with brown hairs, or mixed with black. ♀ with black mixed with brown *nigro-ænea*.
- (19) 20. Species small; face in both sexes clothed with black hairs *Gwynana* and *bicolor*.
- (18) 21. Posterior tibiæ in ♀ clear testaceous *angustior*.
- (17) 22. ♂; mandibles toothed outwardly, or face with pale pubescence. ♀; scopæ brown or ochreous.
- (26) 23. Face in ♂ with white hairs; mandibles with a large wide tooth at the base; hairs of the thorax in ♀ dull ochreous-brown; abdomen densely covered with ochreous-brown hairs.
- (25) 24. Larger. ♂ with the mandibular tooth simply triangular. ♀ with the third antennal joint longer than the next two together *lapponica*.
- (24) 25. Smaller. ♂ with the mandibular tooth wide and dilated, blunt at the apex. ♀ with the 3rd antennal joint only just as long as the next two together *præcox*.
- (23) 26. Face in ♂ with pale hairs; mandibles with only a small basal tooth. ♀; hairs of thorax bright fulvous-brown; abdomen not densely hairy, or with fulvous-brown hairs at the base, and the apex black.
- (28) 27. ♂; vertex of head subquadrate; mandibles only angulated at the base. ♀ with the hairs of the abdomen more or less white *helvola*.
- (27) 28. ♂; vertex of head not subquadrate. ♀ without white hairs on the abdomen.
- (30) 29. ♂ with the mandibular tooth shorter; 3rd sub-marginal cell less narrowed above. ♀; scopæ black-brown *varians*.
- (29) 30. ♂ with the mandibular tooth longer; 3rd sub-marginal cell more narrowed above. ♀; scopæ fulvous-brown *fucata*.

8. *Andrena florea*, Fab.

Fab., Ent. Syst. ii., p. 308; Smith, Cat. Brit. Hym., 2nd ed., p. 30.

Head and thorax black, in the ♂ with ochreous hairs, in the ♀ with brownish hairs. Wings slightly dusky. Abdomen black, closely and distinctly punctured; 1st and 2nd segments more or less red at the apex. Scopæ of

♀ dark brown above. Antennæ of ♂ not reaching to the scutellum, 4th joint shorter than 3rd.

♂. Head and thorax clothed with ochreous hairs. Clypeus largely punctured. Antennæ short, not reaching to the scutellum, 4th joint not more than half as long as 3rd. Vertex punctured, rather quadrate. Mesothorax with its surface dull, very finely rugulose, distantly and finely punctured; metathorax finely rugose. Abdomen shining, subovate; 1st segment scarcely punctured, the following segments deeply and distinctly; segments narrowly impressed and testaceous at the apex; 1st and 2nd with a red apical band; apical segment clothed with short brown hairs. Abdomen beneath clothed with long pale hairs, segments with rather long apical fringes of golden ciliæ. Legs with brownish hairs.

♀. Larger and wider than the ♂. Head and thorax clothed with brown hairs; thorax more closely punctured than in the ♂; puncturation of the abdomen fine and deep, and closer than in the ♂, all the segments narrowly impressed and testaceous at the apex, the 1st and 2nd with a more or less extensive red apical band, 3rd and 4th with an apical line of golden hairs; anal fimbria brown-black; beneath punctured, segments with long apical fimbriæ. Femora and tibiæ beneath with pale hairs, scopæ on their outer surfaces and the tarsi clothed with dark black-brown hairs. Length 11—12 mm.

Hab. Not a common species; it occurs in June, and is very partial to the Bryony. I have taken it pretty freely at Chobham; it has also been taken at Highgate and Weybridge; Blackwater, Hants; Bideford and Ilfracombe, N. Devon.

The short antennæ of the ♂ and the punctured body of the ♀ will separate this species at once from *rosæ*; the dark scopæ and sculpture of the metathorax from *bimaculata*.

9. *Andrena rosæ*, Panz.

Panz., Faun. Germ., 74, 10.

= *austriaca*, Smith, Cat. Brit. Hym., 2nd ed., p. 27
(nec Panz.?)

Black. Antennæ in the ♂ reaching to the 1st abdominal segment; both sexes with one or more of the

abdominal segments red at the apex. Abdomen of the ♀ very finely rugulose, not distinctly punctured; apical dorsal valve not punctured at the apex, and its margin not reflexed. Wings slightly brownish.

♂. Black; face sparingly clothed with brown hairs. Clypeus largely and deeply punctured, its anterior margin emarginate and somewhat reflexed. Antennæ reaching to the base of the abdomen, each joint of the flagellum curved. Vertex punctured, face above the antennæ finely strigose. Mesothorax shining, sparingly clothed with ochreous-brown hairs, clearly but not closely punctured; basal area of the metathorax finely rugose at the base, shining towards the apex, sides finely rugose and punctured, and clothed with long hairs. Abdomen shining, subelongate, clearly punctured, each segment with a narrow red or testaceous apical band, the 3rd and following segments with a line of pale hairs at the apex; 2nd with a few pale hairs on the disk; beneath sparsely punctured and clothed with long hairs, 3rd and following segments ciliated at the apex, apex of 8th segment entire. Legs clothed with pale brownish hairs; tarsi piceous.

♀. Head and thorax clothed with ochreous-brown or reddish brown hairs, those on the face above the antennæ darker. Mesothorax finely and sparsely punctured; metathorax as in the ♂. Abdomen ovate, very finely rugulose, but scarcely punctured, except on the 5th segment; 1st and 2nd segments more or less red at the apex, the sides of the 2nd also in the bright varieties red; the abdomen in some varieties is rather densely clothed with pale hairs, and all the segments bear distinct apical fringes, and are slightly punctured; in the brighter varieties there is generally less pubescence; anal fimbria dark brown; apical dorsal valve simple, and not punctured towards the apex. Abdomen beneath punctured, red at the base, clothed with long pale hairs. Legs clothed with dark brown hairs; femora and scopæ beneath with pale hairs. Length 11—13 mm.

Hab. This is a rare species. I took it last year at Bournemouth off *Rubus* in company with *bimaculata*, and it has occurred at Shirley, Reigate, Hastings, Ilfracombe, and Sidmouth.

Its nearest ally is *Trimmerana*, but the impunctate simple dorsal valve of the 6th segment in the ♀, and

the entire ventral valve of the 8th segment in the ♂, will distinguish it readily; at the same time I should not be surprised to find it some day admitted as the autumn brood of *Trimmerana*; (for its affinities with *florea* see that species).

I have reverted to the name *rosæ* for this species, as Panzer's figure of *austriaca* appears to be in no way like the ♂ here described, but to be probably that of *florea*.

10. *Andrena Trimmerana*, Kirby.

Kirby, Mon. Ap. Angl. ii., p. 116; Smith, Cat. Brit. Hym., 2nd ed., p. 46.

Var. *spinigera*, Kirby, Smith, &c. = *eximia*, Smith.

Stylopedized var. = *piceicornis*, Kirby, Smith, &c. = *picipes*, Kirby, Smith, &c.?

Thorax clothed with brown hairs; face in the ♂ either with black or brown hairs, in the ♀ with brown; cheeks at the base of the mandibles in the ♂ often spinose; base of the abdomen in either sex sometimes more or less red, apical dorsal valve of ♀ closely punctured, its margins slightly reflexed; apical ventral valve of ♂ deeply emarginate; scopæ of ♀ brown-black, pale beneath.

♂. Black; face densely clothed with brown hairs (*Trimmerana* true), or with longer black hairs (*spinigera*); cheeks at the base of the mandibles merely angulated (*Trimmerana*), or produced into a long spine (*spinigera*). Antennæ reaching to the apex of the metathorax, the joints arcuate. Mesothorax finely punctured, clothed with brown hairs; metathorax with its basal area finely rugose at the base. Abdomen very finely punctured, and clothed with long hairs, especially on the disk of the 1st and 2nd segments; apex of each segment narrowly impressed and testaceous, in some varieties with the whole of the 2nd, and part of the 1st and 3rd, red; beneath clothed with long hairs, apex of each segment ciliated, apex of the 8th largely and deeply emarginate. Legs clothed with brownish hairs.

♀. Head and thorax clothed with brown hairs, sculptured, &c., much as in the ♂, but without any spine on the cheek. Abdomen black, with the extreme apices of the segments piceous (*Trimmerana*), or with 1st, 2nd, and 3rd segments more or less red (*spinigera*); each

segment with an apical band of paler hairs, although in the bright varieties the pubescence is much less abundant. Apical fimbria brown-black; apical dorsal valve strongly and closely punctured, its margins slightly reflexed; segments beneath clothed with short black hairs, and fringed with long pale apical hairs. Legs clothed with black-brown hairs; scopæ pale beneath. Length 10—15 mm.

Hab. Var. *Trimmerana* very common in the spring, April, &c., and generally distributed. Var. *Spinigera* rare; it has occurred, however, at Reigate, Canterbury, Ventnor, Exeter, Highgate, Tunbridge Wells, Hastings, Esher, Barham, &c.

Of this species there are certainly two distinct races, *Trimmerana* true and *spinigera*, and hitherto they have always been considered as species. Prof. Perez, however, considers them as only varieties, and I have quite come to the conclusion that he is right—the length of the spine on the cheek of the ♂ varies exceedingly, from a mere angular projection to a spine of one-tenth of an inch long. Last spring my brother sent me a lot of specimens from Canterbury; there were amongst them many ♀ *Trimmerana*, several ♂ *spinigera*, and two ♀ *spinigera*, but no ♂ *Trimmerana*; all these were caught off the same sallow. At Ventnor, in 1880, I took several ♂ *spinigera*, but no ♀, only ♀ *Trimmerana*. Here on Wandsworth Common I find ♂ and ♀ *Trimmerana* abundant. These facts are not, I know, conclusive, but the want of any structural character by which to distinguish the females of the two varieties apart, is, I think, a strong argument in favour of there being but one species, with a dimorphic ♂. F. Smith used to consider only the highly coloured females as *spinigera*; but I have intermediate varieties between them and the ordinary *Trimmerana* which, I think, no one could refer with certainty to either.

Picicornis is only a stylopized form of the above, and I believe I am right in referring *picipes* also to it.

11. *Andrena cineraria*, Linn.

Linn., Syst. Nat., ed. x., vol. i., p. 575; Smith, Cat. Brit. Hym., 2nd ed., p. 33.

Blue-black; pubescence grey; scopæ of ♀ black; wings with an apical cloud.

♂. Head and thorax densely clothed with cinereous hairs, those of the face white. Antennæ reaching to the scutellum. Thorax with an indistinct transverse line of black hairs between the wings. Abdomen shining, blue-black; 2nd and following segments impressed along the apex; 1st segment, and 2nd segment as far as the apical impression, finely punctured and clothed with grey hairs; remaining segments punctured, except on their apical impressions, and clothed with short black hairs; sides and apex with a few long white hairs; segments beneath fringed with long white hairs; tibiæ clothed with black hairs.

♀. Face and thorax with greyish white hairs; a wide black central transverse band on the latter. Abdomen ovate, somewhat shining, blue-black, very finely punctured; apical fringe black. Legs densely clothed with black hairs, except the front femora, which are fringed with white hairs. Segments beneath fringed with black hairs, having a few white ones towards each side. Length 11—14 mm.

Hab. Not uncommon, and widely distributed. Abundantly distinct from all our other species.

12. *Andrena thoracica*, Fab.

Fab., Ent. Syst. ii., p. 328; Smith, Cat. Brit. Hym., 2nd ed., p. 34.

Head clothed with black hairs. Thorax with bright fulvous-brown hairs above, black beneath. Abdomen black, shining, clothed above and beneath, as also the legs, with black hairs.

♂. Vertex of the head rugosely punctured, and clothed along its posterior margin with brown hairs. Antennæ reaching to about the scutellum. Thorax rugosely punctured, but the hairs are so dense that it is difficult to see the actual surface. Abdomen very shining and finely punctured, the 2nd and following segments impressed along the apex; surface clothed with short black hairs; apex of abdomen and segments beneath fringed with long black hairs, segments impressed at the base. Legs with black hairs.

♀ only differs from the ♂ in the stout build and usual sexual characters, short antennæ, in having the 1st and 2nd abdominal segments glabrous and more finely punctured and the segments beneath not impressed at the base.

Legs and the scopæ densely clothed with black hairs.
Length 13—16 mm.

Hab. Common but local, and variable in time of appearance. I have taken it in April and August.

13. *Andrena nitida*, Fourc.

Fourc., Ent. Par., No. 2; Smith, Cat. Brit. Hym., 2nd ed., p. 35.

Black; face clothed with whitish hairs. Thorax with bright fulvous-brown hairs above, with whitish hairs below. Abdomen shining in the ♂, clothed above with pale ochreous hairs; in the ♀ with a lateral patch of ochreous hairs on the 1st, 2nd, and 3rd segments, apical fimbria black; under side and legs in ♂, under side and femora only in ♀, clothed with pale hairs; posterior tibiæ and tarsi densely clothed with black hairs.

♂. Head rugosely punctured on the vertex; face clothed with whitish hairs, margined with black hairs along the eyes; vertex with a few fulvous hairs. Antennæ reaching to the scutellum. Thorax densely clothed with fulvous-brown hairs; mesothorax closely punctured; metathorax finely rugose. Abdomen elongate-ovate, shining, punctured, apex of each segment, except the 1st, rather widely impressed; surface sparingly clothed with pale hairs; beneath clothed with pale hairs, apical segment entire. Legs brownish black, clothed with pale hairs.

♀. Face clothed with short white hairs, those above the antennæ and along the eyes black, those on the vertex fulvous. Thorax as in the ♂, although the colour of the pubescence is brighter and richer. Abdomen widely ovate, black, shining, finely and clearly punctured, the 3rd and 4th segments at the base only; 1st, 2nd, and 3rd segments glabrous on the disk, but with a lateral patch of pale pubescence on each side; 4th with a few black hairs; apical fimbria black, densely clothing the 5th and 6th segments; apical dorsal valve punctured, its edges slightly raised; beneath punctured, clothed with long pale hairs, mixed with black. Femora clothed with long white hairs; intermediate and posterior tibiæ and tarsi with brownish black, posterior tibiæ with pale hairs beneath. Length 12—14 mm.

Hab. Very common in spring, and generally distributed. Could only be confounded with *thoracica*, from which the pale pubescence of the head and under side, and femora, &c., at once distinguish it.

14. *Andrena fulva*, Schrank.

Schrank., Enum. Ins. Austr., p. 400; Smith, Cat. Brit. Hym., 2nd ed., p. 38.

Face of ♂ with white hairs, of ♀ with black. ♂ mandibles very long and curved, toothed outwardly at the base. Thorax densely and abdomen more sparingly clothed with bright brown hairs. Posterior tarsi and extreme apex of tibiae pale. ♀ entirely clothed with bright red hairs above; beneath and legs with black hairs. Wings clear in both sexes, recurrent nervure received near the apex of the 2nd submarginal cell.

♂. Black; head wide; face clothed with white hairs, mixed with pale brown hairs and a few black ones, vertex with pale brown hairs. Antennæ reaching to the scutellum. Mandibles very long, pointed, and curved, base outwardly with a sharp tooth, narrow at its base. Thorax densely clothed with bright brown hairs; basal area of metathorax very finely rugose. Abdomen elongate-oval, slightly shining, finely punctured, except towards the apices of the segments; clothed with golden brown hairs, which are longest on the 1st and 2nd segments; beneath sparsely punctured, apex of each segment with a fringe of long golden brown hairs, apical ventral segment truncate and testaceous at its apex. Legs clothed with golden brown hairs, posterior tarsi and the apical joints of the anterior and intermediate tarsi testaceous.

♀. Head densely clothed with black hairs. Thorax with bright, dark red hairs above, black beneath. Abdomen above rather paler as to its pubescence than the thorax, but very densely clothed with it; the apex of the 5th and the 6th segments clothed with black hairs; under side and legs clothed with black hairs; calcaria and apices of the tarsi pale testaceous. Length 12—14 mm.

Hab. Common in many places in the London district and elsewhere, but apparently local. The ♀ is unlike every other British bee; the ♂ resembles *Trimmerana* as much as any species, but the white hairs of the face and the tooth on the base of the mandibles will separate it at once.

15. *Andrena Clarkella*, Kirby.

Kirby, Mon. Ap. Angl. ii., p. 130; Smith, Cat. Brit. Hym., 2nd ed., p. 39.

Black; face in the ♂ clothed with pale brown hairs, in ♀ with black. 3rd joint of antennæ in ♂ equal to the 4th and 5th together. Thorax in both sexes clothed with brown hairs, which are of a brighter colour in the ♀. Abdomen sparingly clothed with short brownish hairs in the ♂, densely with black hairs in the ♀. Tarsi often pale in the ♂; posterior tibiæ and tarsi in the ♀ clear testaceous; scopæ golden; apical ventral valve of ♂ parallel-sided, rounded at the apex. Wings clear in both sexes, cloudy towards the apex, nervures pale; recurrent nervure received near the apex of the 2nd submarginal cell.

♂. Face clothed with pale brown hairs, margined with black along the eyes. Mandibles rather long, but not pointed, with a tooth close to the apex, base simple. Antennæ reaching to about the scutellum, 3rd joint very long, almost as long as the 4th and 5th together, 4th considerably shorter than 5th. Thorax clothed with brown hairs, intermixed with a few black ones on the sides of the metathorax and below the wings. Abdomen suboval, slightly shining, very finely and remotely punctured, and sparingly clothed with ochreous hairs, the posterior margins of the segments pale, apex clothed with pale golden hairs; beneath punctured, apex of each segment pale, and densely ciliated with short golden hairs; apical ventral valve parallel-sided, rounded at the apex. Legs clothed with pale golden hairs, apex of the posterior tibiæ and tarsi often testaceous.

♀. Head densely clothed with black hairs. Thorax above clothed with fulvous-brown hairs, beneath with black. Abdomen densely clothed with black hairs, in some varieties with a band of paler hairs on each segment; apical dorsal valve triangularly raised in the middle; under side and legs clothed with black hairs; posterior tibiæ and tarsi clear testaceous, clothed with golden hairs. Length 11—13 mm.

Hab. One of the very early spring bees, but not generally common. Norwich, Hampstead Heath, Hastings, Glanville's Wootton, Dorset, Scotland, &c.

The ♀ is quite distinct by its densely hairy black body from all the other species; the ♂ is most like that of *nigroaenea*, but the long 3rd joint of the antennæ will

readily separate it from that species, as well as the position of the recurrent nervure in the 2nd submarginal cell, which in *nigroænea* is received nearly in the middle.

16. *Andrena nigroænea*, Kirby.

Kirby, Mon. Ap. Angl. ii., p. 109; Smith, Cat. Brit. Hym., 2nd ed., p. 45. Stylopedised ♂ = *aprilina*, Smith.

Black, densely clothed with brown hairs. Face in ♂ with long brown hairs, or black hairs mixed with brown. Antennæ reaching to the post-scutellum. Abdomen shining; genitalia small; apical ventral valve entire; ♀, abdomen densely clothed with short hairs; apical fimbria black; dorsal valve flat, punctured; scopæ bright fulvous; tarsi with black-brown hairs. Wings clear, with testaceous nervures.

♂. Face densely clothed with black and brown hairs mixed, or brown in the centre surrounded with black; above the antennæ, between the eyes, longitudinally rugose. Antennæ reaching to the post-scutellum, its joints subarcuate; cheeks simple. Mesothorax, when seen through the dense brown hairs that clothe it, rugosely but not deeply punctured; metathorax finely rugose; basal area finely rugose throughout. Abdomen subovate, shining, finely punctured, and clothed densely on the first four segments with brown hairs, on the last three with black; apical margins of the 2nd and following segments shining and polished; beneath with the segments densely fringed with long hairs, apical valve truncate, entire; genitalia small. Legs clothed with fulvous-brown hairs.

♀. Pubescence of head and thorax as in the ♂, although that on the thorax is generally rather of a richer colour. Abdomen finely and closely punctured, and densely clothed with ochreous-brown hairs, often more or less fulvous on the first four segments, the pubescence at the apex of each segment rather paler; 5th and 6th segments clothed with black hairs; apical dorsal valve simple and punctured; beneath with the segments glabrous on their basal half, punctured and densely clothed with fulvous hairs on their apical half, and with a long apical fringe; anterior and intermediate legs clothed with brown hairs, posterior femora and

tibiæ with bright fulvous, tarsi with dark brown. Length 11—14 mm.

Hab. A common species in spring, April and May.

I do not think this species can well be confounded with others; it is most like *atriceps*, but the clear testaceous tibiæ of the ♀ in that species and the clathrate basal area of the metathorax in both sexes at once distinguish it; the bright fulvous scopæ separate the ♀ from that sex of *Trimmerana* and its allies, and the short antennæ the ♂. I have been able, through the kindness of Mr. C. W. Dale, to examine the type of *aprilina*, Smith, which is only a stylopised form of the ♂ of the above.

17. *Andrena Gwynana*, Kirby.

Kirby, Mon. Ap. Angl. ii., p. 120; Smith, Cat. Brit. Hym., 2nd ed., p. 40.

Black; face in both sexes densely clothed with black hairs; mandibles in ♂ simple. Thorax with ochreous-brown hairs in the ♂, dark fulvous-brown in the ♀. Abdomen finely punctured, shining, and unbanded in ♂; clothed with pale pubescence at the apex of the 1st, 2nd, and 3rd segments in ♀; scopæ fulvous; ♂, anal ventral valve rounded at the apex.

♂. Head about the width of the thorax or slightly wider, clothed with black hairs, largely punctured on the clypeus and face. Antennæ reaching to the scutellum. Thorax clothed with ochreous-brown hairs above, with black beneath; metathorax finely rugose. Abdomen shining, finely punctured, the segments much impressed at the apex, the impressions more shining and not punctured; basal segment and sides of the 2nd clothed with long pale hairs, the rest with short black ones; those at the apex of the abdomen brownish; beneath clothed with long black hairs; pubescence of the legs of the same colour as that on the thorax.

♀. Head densely clothed with black hairs; punctured as in the ♂. Thorax densely clothed with bright fulvous-brown hairs above, black beneath. Abdomen very finely rugulose, shining, and very finely punctured; 1st and 2nd segments clothed with pale fulvous hairs, 3rd and following with black hairs, 3rd at the apex with pale fulvous; anal dorsal valve punctured, its centre triangularly raised; beneath with the apex of each segment

punctured and clothed with long black hairs, and also having a slight central depression noticeable only in certain positions. Legs clothed with black hairs: posterior femora beneath, and scopæ with bright fulvous hairs; tarsi with brown-black hairs. Length 9—11 mm.

Hab. A common species in spring, and generally distributed.

The only species with which it is likely to be confounded is the following, as the black-haired face and simple mandibles of the ♂, and the fulvous scopæ of the ♀ distinguish it from the other small species of this group.

18. *Andrena bicolor*, Fab.

Fab., Syst. Ent., p. 376; Smith, Cat. Brit. Hym., 2nd ed., p. 41.

Differs only from *Gwynana* in the following points:—

The ♂ has the abdomen more strongly punctured and rather less hairy, and the apical ventral valve pale and more truncate, sometimes emarginate, at the apex; the pubescence paler.

The ♀ is rather smaller, with the apical fimbria pale brown, the abdomen rather more punctured, and the pubescence beneath pale, not black. Length 9—10 mm.

Hab. This species occurs in July and August. I have taken it at Hastings, Chobham, Southwold, and Littlehampton. F. Smith says that it frequents the flowers of the mallow. I fancy that it is only the second brood of *Gwynana*, but the ♂ certainly is distinct by its much stronger puncturation.

19. *Andrena angustior*, Kirby.

Kirby, Mon. Ap. Angl. ii., p. 122; Smith, Cat. Brit. Hym., 2nd ed., p. 52.

♀. Very like *bicolor* in many respects, but differing in the slightly longer, clear testaceous posterior tibiæ; the face clothed with pale ochreous hairs; thorax with fulvous hairs; abdomen finely rugulose, the segments widely impressed and pale at the apex; dorsal apical valve smooth, its centre raised, but not triangularly; apical fimbria brown; scopæ golden.

I do not know the ♂, and F. Smith's description does not give any characters to distinguish it from its allies.

Hab. Hampstead, Norwich, &c.; appears in May.

20. *Andrena lapponica*, Zett.

Zett., *Ins. Lapp.*, p. 460; Smith, *Cat. Brit. Hym.*, 2nd ed., p. 49 = *apicatus*, Sm., *Zool. v.*, p. 1748.

Black; clothed in the ♂ with griseous-brown, in the ♀ with ochreous-brown hairs; face in the ♂ with white hairs; mandibles produced outwardly into a triangular tooth at the base. Abdomen shining, first two segments covered with grey hairs. ♀, abdomen dull, clothed with long hairs; apical dorsal valve raised in a triangular form in the middle; scopæ brown.

♂. Black; face clothed with long white hairs, surrounded with black hairs on the sides and vertex; mandibles long, armed at the base outwardly with a triangular tooth. Antennæ reaching to about the scutellum, 3rd joint very narrow at the base. Thorax clothed with brownish grey hairs, paler round the edges; mesothorax dull, very finely and distinctly punctured; metathorax finely rugose at the sides, basal area dull and smoother. Abdomen shining, subelongate; 1st and 2nd segments clothed with grey hairs; 3rd, 4th, and 5th with only a few scattered hairs; 6th and 7th clothed with golden brown hairs; segments beneath punctured, except at their bases, posterior margins ciliated. Legs clothed with grey hairs; apical ventral segment rounded at the apex.

♀. Very like that of *Trimmerana*, but differing in the following characters:—Antennæ decidedly shorter, 3rd joint longer than the next two taken together, much narrowed towards the base; pubescence longer, paler, and not forming such regular apical bands on the abdomen; 2nd submarginal cell of the front wings with the recurrent nervure received nearer the apex than in *Trimmerana*; apical dorsal valve not flat and punctured as in that species, but triangularly raised in the centre, its margins widely depressed. Legs with the pubescence decidedly lighter, of a pale brown; femora and hind tibiæ internally clothed with pale ochreous hairs; beneath, the floccus of the hind femora is very much larger and longer, and the abdomen much more densely covered with hairs; 2nd, 3rd, and 4th segments without the transverse basal line observable in *Trimmerana*. Length 12—15 mm.

Hab. This species has hitherto been rare in England, but it has occurred at Moffat and at Bristol; and I took

several females last spring, and this spring, offallows at Hastings, in April. I suspect it is sometimes overlooked for *Trimmerana*, from which it is, however, structurally abundantly distinct. The ♂ closely resembles that of *præcox*, but its entire 8th abdominal segment, which is rounded at the apex, its larger size, and much less developed mandibular tooth will at once distinguish it. The 3rd joint of the antennæ in both sexes, with its very narrow base, is a peculiar character in this species.

21. *Andrena præcox*, Scop.

Scop., Ent. Carn., p. 301. *Smithella*, Kirby, Smith, Cat. Brit. Hym., 2nd ed., p. 48.

Face of the ♂ above the clypeus with black hairs; clypeus clothed with white; mandibles with a very large, wide, triangular tooth at the base outwardly; apical ventral segment emarginate; pubescence obscure ochreous-brown; tarsi piceous. ♀, upper surface of the insect entirely covered with ochreous-brown hairs; rather brighter on the thorax; apical fimbria brown; scopæ ochreous-brown.

♂. Black; head finely and longitudinally rugose above the antennæ; face above the clypeus clothed with black hairs, clypeus itself with white; sides of the face and clypeus strongly and largely punctured; mandibles long and curved, produced at the base outwardly into a large, triangular, flat tooth, blunt at the apex. Antennæ reaching to the post-scutellum; 3rd and 5th joints subequal in length, 4th rather shorter; vertex of the head deeply emarginate behind; the cheeks much produced and angulated behind the eyes. Mesothorax dull, very finely rugulose, clothed with obscure brown hairs; basal area of metathorax very finely rugulose, sides punctured and rugulose. Abdomen rather shining, sparsely clothed on the basal segment and the base of the 2nd with long ochreous hairs, on the following with short hairs, apex with long pale ochreous hairs; beneath with long hairs, and the segments with golden apical ciliations, apical ventral segment pale at the apex and emarginate. Legs clothed with greyish brown hairs; tarsi piceous.

♀. Face clothed with obscure ochreous-grey hairs mixed with a few black ones; the clypeus finely rugulose and largely punctured, its anterior margin emarginate, but with its angles not produced; 3rd joint

of the antennæ about equal in length to the 4th and 5th together. Thorax and abdomen densely clothed with pale ochreous-brown hairs. Apical fimbria black-brown; apical dorsal valve punctured, triangularly raised in the centre; segments beneath punctured at the apex, and clothed with long pale hairs. Legs brown, clothed with pale brown hairs. Length 8—10 mm.

Hab. Appears in April, and is not a rare species in many places; Hastings, Canterbury, Chobham, Weybridge, Wimbledon, Norwich, &c.

The ♂ is abundantly distinct by the obscure colour of the pubescence, and the large dilated tooth at the base of the mandibles; the ♀ is like a diminutive *lapponica*, but the shorter, stouter, 3rd joint of the antennæ, only equal to the next two joints in length, will distinguish it structurally.

22. *Andrena varians*, Rossi.

Rossi, *Mant. Ins.*, p. 317; Smith, *Cat. Brit. Hym.*, 2nd ed., p. 43.

Face in the ♂ with pale hairs. Mandibles at the base produced and angulated; ♀, face with black hairs. Thorax in both sexes with bright brown hairs. Abdomen in ♂ shining, two basal segments with a few long hairs; tarsi piceous. ♀; two basal segments clothed with bright brown hairs, the rest with black. Scopæ black-brown; hairs beneath black. Wings clear, nervures pale, apex slightly clouded.

♂. Face above the clypeus clothed with pale brownish hairs, clypeus itself with white. Mandibles at the base outwardly with a triangular tooth. Antennæ reaching to the metathorax; 3rd joint slightly longer than the 4th; 4th slightly shorter than the 5th. Vertex of the head deeply emarginate posteriorly, but not so quadrate as in the following. Mesothorax dull, very finely rugulose, clothed with bright brown hairs. Metathorax with rather paler hairs. Abdomen shining, elongate-oval; 1st and 2nd segments sparsely clothed with a few long pale hairs; the 3rd and 4th on the disk with short black hairs, at the sides with longer pale ones; 6th and 7th with pale golden hairs; beneath with the apices of the segments pale testaceous, and clothed with long pale hairs. Apical ventral valve more or less rounded at its

extremity. Legs clothed with pale hairs; tarsi testaceous.

♀. Face densely clothed with black hairs. Clypeus strongly punctured, its anterior margin smooth, rather reflexed, and slightly produced at the lateral angles. Antennæ with the 3rd joint longer than the 4th and 5th together; 6th slightly longer than 5th; 5th slightly longer than 4th. Thorax densely covered with bright fulvous-brown hairs. Abdomen with fulvous hairs on the 1st segment and on the disk of the 2nd; the rest of the abdomen above and below clothed with black hairs; 6th segment with its dorsal valve punctured, triangularly raised in the middle. Legs clothed with dark brown hairs; posterior femora, floccus, and scopæ beneath with pale hairs. Length 9—11 mm.

Hab. A common species in April and May.

I have followed Smith, 1st edition 'Brit. Bees,' in my selection of a ♂ for this species. In the 2nd edition he has reversed the views he held there, but I find that Schenck and Dours both agree with him in his former identification, and give the smaller-headed ♂ with the basal tooth to the mandibles to *varians*. Thomson, on the other hand, gives it to *helvola*, making a third species, *angulosa*. My own firm belief is that they are all varieties of one species, and, if Smith's observations are correct, they quite bear out this view, as in his 1st edition he says that he describes from a pair of *varians* taken *in coitu*, giving the ♂ here described to *varians*; in the 2nd edition he exactly reverses the males, and yet he again observes that he is contrasting males that he has taken *in coitu*.

23. *Andrena helvola*, Linn.

Linn., Syst. Nat., ed. x., vol. i., p. 575; Smith, Cat. Brit. Hym., 2nd ed., p. 42.

Whether this is distinct from the preceding or not has been more or less a question with most authors. The males certainly are different in appearance, but they are different only in characters which might be the result of development, the ♀ only in colour. Such characters as I am able to detect I give below.

♂. Differs from that of *varians* in the larger, more quadrate, vertex of the head, the lateral angles of which

are accordingly more produced backwards and farther from the back of the eye; the mandibles are simple at the base, and not produced into an angular tooth; the abdomen is rather wider and more pubescent, its surface less shining, and more distinctly, though exceedingly finely, rugulose; lastly, the apical ventral segment is truncate at its extremity. These may seem to be good characters, still they all tend to vary in a long series. The most characteristic are doubtless the large head and simple mandibles, as in most cases where development of the head takes place a character such as the basal mandibular tooth would be developed too, whereas here the reverse takes place, and the simple mandibles are with the large-headed form.

♀. Only differs, so far as I know, by the white pubescence on the abdomen and face, which takes the place of the black in *varians*; still, however, the white is often mixed with the black, sometimes more and sometimes less. I have one specimen which has no black hairs on the abdomen at all, except on the two apical segments, and taken alone it would stand as a really good species. I have others with white hairs at the apex of each segment, mixing with black towards the base; others again with only indications of white pubescence, and this tendency to vary, unaccompanied, so far as I can see, by any structural character, makes me very doubtful as to the distinctness of the species.

24. *Andrena fucata*, Smith.

Smith, Zool. v., p. 1743; Cat. Brit. Hym., 2nd ed., p. 54 = *clypearis*, Nyl.

This species is also closely allied to *varians* and *helvola*, but the fulvous scopæ of the ♀ and the more strongly dentate mandibles of the ♂ will serve to distinguish it.

♂. The other characters which are worth notice are its slightly longer antennæ, the longer pubescence of the face, the shape of the 3rd submarginal cell in the fore wings, which is more narrowed above, its upper margin not being nearly half as long as its lower, and the position of the recurrent nervures, which are received slightly nearer the apices of the 2nd and 3rd submarginal than in the allied species. Apical ventral valve testaceous, and rounded at the extremity.

♀. Face clothed with white hairs, inclining to

fulvous towards the vertex; clypeus strongly punctured; anterior margin raised and shining, with the angles produced and more prominent than in the preceding species. Thorax clothed with bright brown hairs above, and white hairs beneath and at the sides of the metathorax. Abdomen nearly dull, its surface very finely rugulose; basal segment and base of the 2nd with a few long pale hairs; following segments almost naked, with a few short pale hairs at the base and sides; apical fimbria brown; segments beneath fringed with very pale fulvous hairs. Legs with the femora clothed with white hairs, floccus white; tibiæ of anterior and intermediate pairs with short brown hairs, scopæ pale fulvous; tarsi piceous, clothed with brown hairs. Length 9—11 mm.

Hab. Not common. Chobham (June); Charlwood, near Reigate; Wakefield, Yorkshire (June); Bristol, and Scotland.

Division IV.

- (2) 1. ♂; abdomen testaceous at the base; tibiæ testaceous. ♀; tibiæ clear testaceous *ferox*.
 (1) 2. ♂; abdomen not testaceous at the base; tibiæ pale only at the apex. ♀; tibiæ dark *bucephala*.

25. *Andrena ferox*, Smith.

Smith, Zool. v., p. 1670; Cat. Brit. Hym., 2nd ed., p. 32.

Black; head very large in the ♂; mandibles acutely spined at the base; base of abdomen more or less testaceous; ♀ with the apical fimbria fulvous-brown; posterior tibiæ clear testaceous; scopæ bright golden yellow. Wings slightly dusky, nervures pale.

♂. Head and thorax clothed with pale yellowish hairs, disk of latter nearly naked. Head very large; antennæ reaching to the metathorax; mandibles angulated outwardly at the base and spinose in some specimens (*fide* Smith). Abdomen very shining; apex of the 1st and 2nd segments, and sometimes the base of the 2nd and 3rd, widely testaceous; apex with pale golden hairs. Legs clothed with golden hairs, with the posterior tibiæ, and the apices of the others and all the tarsi, pale testaceous.

♀. Black. Head and thorax clothed with brown hairs; mandibles very wide at the base, their lower

margins produced into a membranous sort of wing; clypeus rugosely punctured, with a smooth raised dorsal line. Mesothorax almost naked in the centre, dull, finely and irregularly punctured. Scutellum rather shining and more strongly punctured. Abdomen dull, the apical margins of the segments testaceous, and fringed with short golden hairs at the sides; apical fimbria brownish; beneath punctured, apices of the segments pale, and fringed with long pale hairs. Legs piceous, clothed with golden hairs; posterior tibiæ and tarsi clear testaceous-yellow, clothed with pale golden hairs. Length 9—12 mm.

Hab. Very rare. The only recorded localities for it are Bristol, Windsor, and Hastings.

This is a very distinct species, the pale legs of the ♂ and the clear testaceous posterior tibiæ of the ♀ distinguishing it at once from its nearest ally, *bucephala*.

26. *Andrena bucephala*, Steph.

Steph., Ill. Brit. Ent. Suppl. 17, pl. xliii., f. 4, ♂; Smith, Cat. Brit. Hym., 2nd ed., p. 61.

Black. Head in the ♂ very large; mandibles simple. Thorax clothed with brown hairs. Abdomen shining; apical ventral segment deeply emarginate at the apex; apex of tibiæ and all the tarsi testaceous; ♀ black; segments of abdomen narrowly pale and fringed with white hairs; apical fimbria brown; posterior tibiæ and tarsi piceous, clothed with golden hairs.

♂. Head very large, sometimes nearly twice as wide as the thorax; clypeus shining and punctured, clothed with long hairs at the sides; mandibles long and falcate, piceous at the tips. Antennæ reaching to the apex of the metathorax; 3rd joint shorter than the two following together; 4th and 5th subequal. Thorax clothed with bright brown hairs; metathorax with the basal area narrow and smooth at each side. Abdomen shining, the apex of each segment rather widely testaceous; apical ventral segment narrow, rather widened at the apex, and deeply emarginate. Legs clothed with pale hairs; apices of the tibiæ and the tarsi testaceous.

♀. Head clothed sparingly with pale hairs; clypeus largely punctured, with a smooth dorsal line; antennæ rather long, reaching to the metathorax; lateral

impressions on the inner margins of the eyes filled with golden velvety hairs. Thorax clothed with pale hairs round the edges, and with fulvous hairs on the disk. Scutellum, post-scutellum, and basal area of metathorax longitudinally impressed down the centre. Abdomen somewhat dull, clothed with a very short pale pubescence; apical margins of the segments pale, narrowly fringed with white hairs; apical fimbria golden brown; beneath punctured, the posterior margins of the segments pale and fringed with long hairs. Legs clothed with pale hairs; posterior tibiæ and all the tarsi piceous, translucent; tibiæ and tarsi narrower than in most of the species, giving them an unusually elongate appearance. Length 9—12 mm.

Hab. Local. Hampstead, Bristol, Chobham Common.

Division V.

- (10) 1. ♂; labrum tuberculated, the tubercle much raised and emarginate in front. ♀; scopæ black, dull brownish, or reddish brown.
- (9) 2. ♂; abdomen densely covered with pale hairs; mandibles not long and falcate. ♀; disk of thorax densely clothed with pale or bright fulvous hairs.
- (6) 3. ♂; apical ventral segment bilobed at the apex. ♀; 5th abdominal segment clothed with erect black hairs.
- (5) 4. ♀ with dense black scopæ; face with black pubescence *nigriceps.*
- (4) 5. ♀ with brown scopæ; face with pale pubescence *simillima.*
- (3) 6. ♂; apical ventral valve entire at the apex. ♀; 5th abdominal segment with adpressed brown-black hairs, or pale hairs.
- (8) 7. ♂; larger; abdomen less distinctly banded; apical ventral segment slightly dilated and subtruncate at the extremity. ♀; 5th abdominal segment with pale hairs *tridentata.*
- (7) 8. ♂; smaller; abdomen more distinctly banded; apical ventral segment not dilated, rounded at the extremity. ♀; 5th abdominal segment with dark hairs *fuscipes.*
- (2) 9. Hairs on disk of thorax black or nearly so. ♂; mandibles long and falcate; segments of abdomen with only pale apical bands *denticulata.*
- (1) 10. ♂; tubercle of labrum transverse, simple. ♀; scopæ bright fulvous yellow.
- (12) 11. Pubescence of the face below the antennæ white in both sexes *fasciata.*
- (11) 12. Pubescence of the face below the antennæ pale brown in both sexes *fulvicrus.*

27. *Andrena nigriceps*, Kirby.

Kirby, Mon. Ap. Angl. ii., p. 134, ♀ (nec ♂); Smith, Cat. Brit. Hym., 2nd ed., p. 50, ♀ (nec ♂).

Black. Face and under side in ♂ with whitish, in ♀ with black, hairs. Thorax with bright fulvous hairs. Abdomen with wide apical bands of fulvous hairs, the bands of the 3rd and 4th segments in the ♂ paler; anal fimbria in ♀ black. Legs with pale hairs in ♂, black in ♀. Apical ventral valve of ♂ deeply emarginate. Wings clear; nervures piceous.

♂. Head as wide as the thorax or wider, closely punctured, more or less shining on the vertex and behind the eyes; clypeus emarginate; labrum tuberculated, hairy at the sides, the tubercle emarginate in front; face clothed with nearly white hairs on the clypeus, and with very pale fulvous hairs above it. Antennæ not quite reaching to the scutellum; 3rd joint about once and a half as long as the 4th; 4th slightly shorter than 5th. Mesothorax clothed with bright fulvous hairs, largely and deeply punctured and shining on the disk, closely and finely round the edges. Scutellum shining at the base, finely punctured at the apex, with an irregular dorsal line of punctures. Metathorax dull, finely rugose, the sides of the basal area indicated by a smoother, somewhat shining, line. Abdomen dull, punctured; 1st and 2nd segments almost entirely clothed with fulvous hairs; 3rd and 4th segments clothed with paler shorter hairs, and with a distinct pale apical band; 5th and 6th segments with black hairs at the base, pale at the apex; apical fimbria brown; beneath punctured; the segments with long white apical fringes; apical ventral segment deeply emarginate and testaceous at the apex. Legs clothed with pale hairs; tarsi piceous at the apex.

♀. Face densely clothed with black hairs. Clypeus rugosely punctured. Vertex with fulvous-brown hairs. Thorax densely clothed with fulvous-brown hairs above, with black below; sculptured as in the ♂. Abdomen dull, punctured; 1st and 2nd segments almost entirely clothed with pale fulvous hairs; the 3rd and 4th with black hairs at the base, with fulvous hairs at the apex, forming a wide apical fascia; 5th and 6th clothed with black hairs; apical dorsal valve not punctured, impressed at the sides; beneath punctured, clothed with sooty black hairs. Legs densely covered with black

hairs ; tarsi piceous at the apex ; calcaria pale. Length 11—12 mm.

Hab. Rare. Southwold, Lowestoft, Norwich, Deal, Bournemouth, Ilfracombe, &c.

28. *Andrena simillima*, Smith.

Smith, List of Brit. Anim. Coll. B. M., pt. vi., App., p. 122 ; Cat. Brit. Hym., 2nd ed., p. 50.

“♂. Black ; the face clothed with pale pubescence ; that on the clypeus anteriorly is white, its anterior margin emarginate, the lateral angles produced into sharp teeth ; the labrum bidentate. Mandibles forcipate, their tips ferruginous. Antennæ not quite as long as the thorax. Thorax clothed above thinly with fulvous pubescence, beneath it is white. Wings as in ♀. Abdomen ovate-lanceolate, the segments thinly fringed with pale pubescence ; the apex fulvous.”

I do not know the ♂, so have copied F. Smith's description.

♀. Very like *nigriceps*, but rather smaller, the face and under side clothed with pale fulvous hairs, and the 3rd and 4th segments of the abdomen without such deep black hairs on their basal half. Legs clothed with paler hairs than in that species. From *pubescens* it differs at once by the simple impunctate apical dorsal valve, and the deep black suberect pubescence of the 5th segment. Length 9—10 mm.

Hab. Rare. Kingsdown, near Deal ; Isle of Wight, Bournemouth, &c.

29. *Andrena denticulata*, Kirby.

Kirby, Mon. Ap. Angl. ii., p. 133 : Smith, Cat. Brit. Hym., 2nd ed., p. 53 = *Listerella*, Kirby.

Black. Face clothed with pale brownish white hairs. Mandibles of ♂ long and falcate. Thorax in both sexes sparingly clothed on the disk with black-brown hairs, and with pale hairs at the sides. Segments of the abdomen with pale apical bands. Scopæ of ♀ reddish brown. Wings somewhat dusky, especially at the apex.

♂. Head wider than the thorax ; face clothed with

pale brownish hairs; labrum tuberculated, the tubercle deeply sulcate down the middle; mandibles long and falcate; cheeks with a slight angle at the base of the mandibles; antennæ not reaching to the scutellum; vertex shining, irregularly punctured, quadrately produced behind the eyes, its posterior margin deeply emarginate. Mesothorax dull, finely punctured, clothed on the disk sparingly with black-brown hairs, on the sides with paler hairs. Scutellum shining, remotely punctured. Metathorax finely rugose, clothed with long pale hairs. Abdomen subelliptic; basal segment with long scattered pale hairs; 2nd with a band of short pale hairs at the apex on each side, and a few long scattered hairs on the disk; 3rd and 4th with an entire apical band; the base of the 2nd, 3rd, and 4th segments clothed with erect black-brown hairs, and the 5th and following segments entirely so clothed; beneath 2nd to 5th segments with long pale apical fringes; apical valve rounded at apex. Legs piceous; tibiæ and tarsi with reddish brown hairs, tarsi testaceous.

♀. Rather like the ♂, but with the head less quadrate on the vertex; the thorax clothed as in that sex. Abdomen dull, elliptic; basal segment and disk of the 2nd with long scattered hairs; apex of the 2nd, 3rd, and 4th with an entire band of decumbent whitish hairs; the disk of these segments with short black hairs; 5th at the apex with sooty hairs; 6th clothed with nearly black hairs; apical dorsal valve punctured, flat, with its margins reflexed; beneath with long pale hairs. Legs: femora with pale hairs; tibiæ and tarsi with red-brown hairs, those of the scopæ rather duller, those of the tarsi brighter, tarsi piceous. Length 9—11 mm.

Hab. Not uncommon. Chobham, Bournemouth, Carlisle, Southend. F. Smith says he has taken it on Bryony; I have taken it myself on *Senecio* and thistle-heads. It is a very distinct species, and I do not think it can be confounded with any other.

30. *Andrena fuscipes*, Kirby.

Kirby, Mon. Ap. Angl. ii., p. 136 = *pubescens*, Kirby; Smith, Cat. Brit. Hym., 2nd ed., p. 51.

Black. Head and thorax clothed with fulvous hairs, often almost grey in the ♂. Abdomen in the ♂ densely

covered with hairs, with paler bands at the apex of the segments; apical ventral segment rounded at the apex, in ♀ with five pale pubescent bands; 5th and 6th segments with black-brown hairs. Legs with brown hairs.

♂. Face deeply punctured and clothed with long pale fulvous hairs. Vertex behind the eyes shining and sparingly punctured. Labrum tuberculated, sulcate in front. Antennæ reaching to the base of the metathorax. Mesothorax and scutellum shining, largely punctured, clothed with pale fulvous hairs. Metathorax finely rugose. Abdomen with the posterior margins of the segments narrowly testaceous, densely clothed with pale fulvous hairs, becoming quite grey after exposure, and forming a distinct wide band at the apex of each segment; pubescence of 6th and 7th segments pale; beneath with pale apical margins to the segments and long pale hairs; apical ventral valve rounded and testaceous at the apex. Legs clothed with pale hairs; tarsi testaceous.

♀. Face sparingly clothed with pale fulvous hairs on the sides; clypeus largely punctured, orbital impressions filled with brown velvety pubescence. Antennæ pale beneath towards the apex. Thorax clothed with rather bright pale fulvous hairs; mesothorax dull, punctured; scutellum shining, largely and irregularly punctured; metathorax finely rugose. Wings with a slight apical cloud; nervures dark piceous. Abdomen: 1st segment clothed with long fulvous hairs, and with an apical band of rather paler hairs; 2nd, 3rd, and 4th segments with a short pale erect pubescence at the base, and with a wide apical band of decumbent pale hairs; 5th and 6th segments clothed with decumbent brown hairs; apical dorsal valve finely punctured and triangularly raised in the middle; beneath punctured and clothed with long hairs on the apical portions of the segments. Femora clothed with pale hairs, floccus large and pale; tibiæ and tarsi clothed with brown hairs, paler on their under sides, tarsi testaceous. Length 9—10 mm.

Hab. Common on *Erica*, &c., in heathy localities, in July and August. The pubescence fades very much on exposure. It is easily distinguished from either of the preceding by the decumbent hairs of the 6th segment; in the other two the hairs are suberect, and form a projecting fringe.

31. *Andrena tridentata*, Kirby.

Kirby, Mon. Ap. Angl. ii., p. 132; Smith, Cat. Brit. Hym., 2nd ed., p. 52.

Black; clothed with pale fulvous pubescence. ♂ with the ventral apical valve entire and somewhat truncate; ♀ with the apical fringe pale; the hairs on the extreme apex of the 5th segment and those on the 6th reddish golden. Scopæ very pale fulvous.

♂. Very like that of *fuscipes*, but larger, the abdomen more hairy, the hairs longer and not forming such distinct apical bands, the apical ventral segment wider at the apex and more truncate.

♀. Differs from *fuscipes* in the paler colour of the pubescence, in having the antennæ with the apical joints entirely pale, the 5th abdominal segment with pale hairs slightly golden at the apex, and the 6th with reddish gold hairs; pubescence of the legs paler, that of the scopæ being pale whitish, with a slightly fulvous tint, that of the tarsi pale cinnamon-brown; tarsi testaceous. Length 10—11 mm.

Hab. Very rare, especially the ♀. Southwold; Norwich; Cromer; Bournemouth; Christchurch, Hants. Occurs on the ragwort.

32. *Andrena fulvicrus*, Kirby.

Kirby, Mon. Ap. Angl. ii., p. 138; Smith, Cat. Brit. Hym., 2nd ed., p. 57.

Face in the ♂ clothed with long brown hairs mixed with black; of ♀ with brown hairs. Thorax with brown hairs in both sexes. Abdomen in the ♂ clothed with pale ochreous hairs, each segment with an apical band of ochreous hairs, hairs of apical segment brown. ♀; abdomen clearly and closely punctured, first four segments with an apical band of very pale fulvous pubescence, sometimes white; apical fimbria long and black. Scopæ golden.

♂. Face densely clothed with brown hairs surrounded with black; labrum without the raised sulcate tubercle observable in the foregoing species. Vertex dull, punctured. Antennæ not reaching to the scutellum. Mesothorax dull, punctured, clothed with obscure brownish hairs. Metathorax rugose, hairy all over like the

mesothorax. Abdomen slightly shining, finely and rugosely punctured, clothed with pale hairs on the first two segments, and with black hairs on the remainder; each segment to the 5th with an apical band of pale ochreous hairs; 6th and 7th segments entirely clothed with brown hairs; beneath clothed with long pale hairs; apical ventral valve rounded at the apex, and slightly and narrowly emarginate in the centre. Legs clothed with ochreous hairs; tarsi piceous.

♀. Face clothed with fulvous-brown hairs. Vertex with black-brown; mesothorax dull, closely punctured, clothed with dusky brown hairs on the disk, and with fulvous-brown hairs round the sides. Scutellum rather shining, and remotely punctured. Metathorax finely rugose, clothed with long fulvous-brown hairs. Abdomen finely and very closely punctured, the puncturation of the basal segment rather less close than that of the following; the 1st to the 4th segments with an apical band of pale fulvous hairs fading to white, that on the 1st often wanting; 5th and 6th with long black hairs; apical valve punctured, its margin very slightly and narrowly reflexed; segments beneath fringed at the apex with bright fulvous hairs. Legs, especially the posterior tibiæ, clothed with bright fulvous hairs. Length 10—12 mm.

Hab. A very common species; it appears in April, and again sometimes in August. *Extricata*, Smith, is only a variety with white bands, and is quite distinct from the following, although often regarded as the same by continental authors.

33. *Andrena fasciata*, Nyl.

Nyl., (Revisio), Not. Salls. Faun. Flor. Fenn., Förh. ii., p. 256.

Very like the preceding, but differing in the following particulars:—

The pubescence of the face in both sexes is white, also that of the under side of the thorax and femora; the abdomen in the ♂ is clothed with rather longer pubescence than in *fulvicrus*, and the apical bands are formed of longer less decumbent hairs; the puncturation also is more distinct, and the genitalia lack the notch-like sinuation on the outer margin near the apex observable in *fulvicrus*. The ♀ has the abdomen rather more

closely punctured than in *fulvicrus* on the basal segment, the apex of which has a pale fulvous band, often nearly or quite white; the next three segments have pure white bands, composed of rather longer and less closely adpressed hairs than in that species; beneath clothed with white hairs; scopæ bright golden fulvous. Length 10—12 mm.

Hab. Rare; has occurred at Hastings, Tunbridge Wells, and Canterbury; it appears in April.

Division VI.

- (4) 1. Legs entirely black in both sexes; ♂, clypeus not white; ♀, abdominal bands very narrowly interrupted; scopæ dull greyish brown.
- (3) 2. Abdomen distinctly punctured *argentata*.
- (2) 3. Abdomen not punctured *albicus*.
- (1) 4. Legs in both sexes with the tibiæ or tarsi more or less pale. ♀, abdominal bands, when present, widely interrupted. ♂, clypeus white in some species.
- (12) 5. ♂, clypeus white; or if black, then with distinct white apical lines of pubescence at the sides of the 2nd, 3rd, and 4th abdominal segments. ♀, abdomen with distinct lateral streaks or bands.
- (7) 6. ♂, clypeus white; mesothorax densely clothed with fulvous-brown hairs; tibiæ more or less testaceous. ♀, anal fringe bright golden; wings brownish, their nervures pale testaceous *chrysosecles*.
- (6) 7. ♂, clypeus white, or sometimes black; mesothorax with only a sparse greyish pubescence; tibiæ black. ♀, anal fringe dull; wings with dark piceous nervures.
- (9) 8. ♂, clypeus only white. ♀, tibiæ of posterior legs testaceous *analis*.
- (8) 9. ♂, clypeus black, or clypeus and sides of the face also white. ♀, posterior tibiæ black.
- (11) 10. ♂, clypeus black; tarsi testaceous. ♀, scutellum scarcely punctured *lucens*.
- (10) 11. ♂, clypeus and side of face white. ♀, scutellum densely punctured *coitana*.
- (5) 12. Clypeus black in both sexes; abdomen without white pubescent bands or lateral streaks.
- (14) 13. Smaller, rather coarsely punctured *fulvago*.
- (13) 14. Larger, finely and closely punctured *polita*.

34. *Andrena albicus*, Kirby.

Kirby, Mon. Ap. Angl., ii., p. 156; Smith, Cat. Brit. Hym., 2nd ed., p. 61.

Black; face, under side, and legs in the ♂ clothed with silvery hairs. Thorax above with very pale fulvous hairs, darker on the scutellum and the posterior portion of the mesothorax. ♀ with the face and thorax clothed with fulvous hairs, paler beneath. Abdomen in both sexes shining, rather flat, elliptic in ♂, ovate in ♀, without definite punctures, and clothed with long pale hairs; each segment with an interrupted apical band of pale hairs. Scopæ of ♀ pale brown. Wings nearly clear.

♂. Face densely clothed with long silvery white hairs. Antennæ reaching to the scutellum. Mesothorax dull, clothed in front and on the sides with whitish hairs, posteriorly with fulvous. Scutellum with fulvous hairs. Metathorax finely rugose, clothed with fulvous hairs; the thorax beneath clothed with silvery hairs. Abdomen elliptic, shining, clothed with long scattered white hairs; each segment with an apical band of silvery hairs, narrowly interrupted in the centre; 6th and 7th segments clothed with white hairs with a slight golden tinge; beneath, apex of each segment piceous, and fringed thickly with short silvery hairs; apical ventral segment rounded at the apex. Legs densely clothed with silvery hairs; tarsi piceous.

♀. Head and thorax clothed with fulvous-brown hairs; mesothorax dull, punctured; metathorax finely rugose. Abdomen rather flat, ovate, shining, without definite puncturation; 2nd and following segments widely impressed along the apical margin; all the segments clothed sparingly with pale hairs; those on the 1st and 2nd longer than those on the following; 1st to 4th segments each with a narrow apical band of pubescence, that on the 1st fulvous, on the others white, and interrupted narrowly in the centre; 5th and 6th segments clothed with brown hairs; apical dorsal valve shining, triangularly raised in the centre; beneath finely and rugosely punctured, the apex of each segment narrowly pale, and thickly fringed with silvery hairs. Legs clothed with fulvous-brown hairs, those on the inner margin of the posterior tibiæ paler; floccus white; tarsi dark piceous. Length 9—11 mm.

Hab. Common; appears about the end of April, and is generally distributed.

35. *Andrena argentata*, Smith.

Smith, Zool., ii., p. 409; Cat. Brit. Hym., 2nd ed., p. 67.

Black, shining. ♂ clothed with long hoary pubescence. Abdomen shining, punctured; apex of each segment with a white pubescent band; apex of abdomen with golden hairs. Metatarsi black, four following joints piceous. ♀ with the pubescence of the head and thorax brownish. Abdomen shining, punctured; basal segment very remotely punctured; apex of each segment with a white band. Scopæ very pale greyish brown. Wings slightly dusky.

♂. Face clothed with grey hairs; clypeus dull, punctured. Antennæ reaching to the apex of the scutellum. Thorax clothed with grey hairs; mesothorax dull, largely and shallowly punctured; metathorax finely rugose. Abdomen ovate, shining; basal segment very remotely punctured, with a few long white hairs on the sides; following segments very finely and less remotely punctured; all the segments with a white apical band, widely interrupted in the centre of the 1st, and very narrowly in the three following; apical fringe pale golden; beneath with the apical margins of the segments pale, and fringed with long white hairs; apical ventral valve rounded and pale at the apex. Legs clothed with silvery hairs; apical joints of the tarsi piceous.

♀. Head and thorax punctured as in the ♂, but with the pubescence pale mouse-brown; that on the sides of the thorax paler. Abdomen ovate, shining; basal segment very finely and remotely punctured, with a few long hairs at the base and sides, its apex with a widely interrupted band of white hairs; following segments more closely punctured, impressed at the apex; 2nd, 3rd, and 4th with a white apical band, that of the 2nd interrupted in the centre; 5th and 6th clothed with pale brown hairs; apical dorsal valve triangularly raised in the middle, the flattened margin very wide; segments beneath narrowly pale at the apex, and fringed with long pale hairs. Legs densely clothed with pale brown hairs, those of the intermediate tibiæ dark; tarsi dark piceous. Length 8—10 mm.

Hab. In heathy localities, on flowers of *Erica*; Sandhurst, Chobham, Weybridge, Bournemouth, &c. July

and August. Last year at Bournemouth the ♂ was common at the end of July, but I obtained no ♀.

36. *Andrena chrysoceles*, Kirby.

Kirby, Mon. Ap. Angl., ii., p. 143; Smith, Cat. Brit. Hym., 2nd ed., p. 63.

Black; abdomen shining. ♂, clypeus white. ♀, face much wider than long; 3rd and 4th segments of abdomen in both sexes with an apical streak of silvery hairs on each side; apical fimbria bright golden; tarsi in both sexes, the base and apex of the posterior tibiæ in the ♂, and the entire posterior tibiæ in the ♀, clear testaceous. Wings slightly dusky; nervures testaceous.

♂. Face above the clypeus clothed with fulvous hairs; clypeus white, with two small black dots on the disk, and clothed with long white hairs. Antennæ reaching to the metathorax. Thorax finely rugulose and shallowly punctured; mesothorax and scutellum with fulvous hairs; metathorax finely rugose, its hairs paler than those of the scutellum. Abdomen shining, subelliptic, with a fine pale adpressed pubescence; basal segment finely and remotely punctured, the following more closely, and with a rather wide apical depression; all the segments pale at the extreme apex; the 2nd, 3rd, and 4th with a short, very narrow apical streak of white hairs on each side; apex of 5th, and the 6th and 7th segments with pale golden hairs; beneath clothed with long hairs; apex of 3rd, 4th, and 5th segment with a dense fringe of golden hairs; apical ventral valve pale, and somewhat pointed at the apex. Legs clothed with pale hairs; posterior tibiæ at the base and apex, and all the tarsi clear testaceous.

♀ larger than the ♂, but much like it in puncturation, &c.; face transverse, the clypeus black, and the bands of the abdomen more distinct, there being an interrupted apical band of silvery white hairs on the 2nd and 3rd segments, and an entire band on the 4th; the apex of the 5th, and the 6th densely clothed with golden hairs; apical dorsal valve piceous, flat, punctured, except at the margins, which are narrowly reflexed; beneath, the segments are punctured towards the apex and fringed with long hairs. Legs clothed with pale hairs; all the tarsi and the posterior tibiæ clear testaceous. Length 9—11 mm.

Hab. A somewhat rare species, occurring on *Umbelliferae*, &c., in the summer, from May to August. London district, Chobham, Charlwood (Surrey), Hastings, Norfolk, and Devonshire.

37. *Andrena analis*, Panz.

Panz., Faun. Germ., 90, 14 & 15; Smith, Cat. Brit. Hym., 2nd ed., p. 64.

Shining, deep black. ♂, clypeus alone white; tarsi testaceous; tibiæ black. ♀, 1st and 2nd segments of the abdomen with a very narrow line of white pubescence at the apex; apical fimbria brown; posterior tibiæ and tarsi clear testaceous. Wings dusky; nervures piceous.

♂. Black, shining; head and thorax clothed with greyish hairs intermixed with black ones; clypeus white, with two small black dots, and clothed with white hairs; antennæ dark piceous; vertex shining, rugosely punctured; mesothorax shining, rather largely punctured; metathorax finely rugose. Abdomen shining, sparingly clothed with pale hairs, elongate; apex of 2nd and following segments deeply impressed; basal segment with only a few scattered punctures; the remaining segments more closely and rather largely punctured; apex of each segment impunctate, and with a fringe of very short pale hairs; apical dorsal valve testaceous and emarginate; beneath with long white hairs. Legs with erect white hairs; tarsi clear testaceous.

♀. Clypeus black; each side of the face clothed with white hairs, and with a few black ones near the insertion of the antennæ; vertex clothed with pale hairs behind, and with black in front. Mesothorax shining, punctured; disk very sparingly clothed with pale and black hairs intermixed; sides and beneath with grey hairs. Scutellum punctured. Metathorax finely rugose, with a dense long white pubescence on each side. Abdomen elliptic, finely punctured; segments impressed at the apex; 1st and 2nd segments with an apical fringe of very short white hairs; 3rd and 4th with a few short hairs at each side; 5th on its apical half, and the 6th clothed with brown hairs; apical dorsal valve flat; beneath punctured; segments fringed with long hairs at the apex. Legs with white hairs; femora densely clothed with long white hairs beneath, floccus white; posterior tibiæ and tarsi, and the apical joints of the

tarsi of the other legs, clear testaceous. Length 8—9 mm.

Hab. Common in some localities, especially in the north; Berwickshire, Wakefield, Ireland, Weybridge, July; Chobham, August; and one ♀ as early as June.

Is most like the following, under which their differences are pointed out.

38. *Andrena coitana*, Kirby.

Kirby, Mon. Ap. Angl., ii., p. 147; Smith, Cat. Brit. Hym., 2nd ed., p. 64.

Deep black, shining. ♂ with the clypeus and a spot on each side of the face, near its anterior lateral angle, white; legs entirely black. ♀ with a silvery white lateral spot at the apex of the 2nd and 3rd segments; legs entirely black; scopæ brown.

♂. Head rather wide, dull, finely and closely punctured, clothed with brown hairs on the vertex and the face above the antennæ, and with white hairs on the clypeus; clypeus shining, remotely punctured, white, with two black discal dots; labrum tuberculate; just at the side of the clypeus on each side of the face is a small white spot, which has almost the appearance of being part of the clypeus itself. Mesothorax very shining, with a few scattered brownish hairs, remotely punctured. Metathorax finely rugose. Abdomen shining, segments not impressed at the apex, very finely punctured at the base; 1st, 2nd, and 3rd segments each with a few pale lateral hairs at the apex; 4th and 5th with an apical band of pale hairs; 6th and 7th entirely clothed with them; beneath clothed with white hairs; apical valve rounded at the extremity. Legs entirely black, clothed with silvery white hairs.

♀. Head and thorax dull, closely punctured, with a few scattered very short hairs; clypeus black; frontal impressions filled with brown velvety hairs; scutellum closely punctured, especially round its edges; metathorax finely rugose, its basal area small. Abdomen very shining, elliptic; basal segment remotely punctured; the other segments impressed at the apex, and somewhat closely punctured at the base; 2nd and 3rd segments with an apical streak of white hairs on each side; 4th with an entire line of white hairs at the apex; 5th and

6th clothed with brownish hairs; apical dorsal valve flat; segments beneath punctured, each with an apical fringe of brownish hairs. Legs black, clothed with pale hairs; those of the scopæ with a brownish tinge. Length 8—9 mm.

Hab. Common in sandy and heathy localities.

The ♂ is very like that of *analis*, but the white spot on each side of the clypeus, the less hairy body, and the want of the apical impressions of the abdominal segments will distinguish it at once. The ♀ can only be confounded with the following; see notes to that species.

39. *Andrena lucens*, Imhoff.

Imhoff., Mitth. Schweiz. Ent. Ges., ii., p. 67.

Very like the preceding in general appearance, but differing in the following points:—

♂. Clypeus black; face clothed with longer hairs; vertex of the head more emarginate; mesothorax more closely punctured and more hairy at the sides; abdomen more ovate and more convex; 2nd, 3rd, and 4th segments impressed at the apex; 2nd and 3rd with a narrow distinct lateral line of white pubescence; the 4th with a continuous band; beneath, the 3rd, 4th, and 5th segments are densely fringed at the apex with somewhat recurved pale hairs, shortest in the middle; apical ventral valve somewhat truncate; all the tarsi clear testaceous.

♀ with the head wider than in *coitana*; the face clothed with white hairs; the scutellum dull and scarcely punctured; the basal area of the metathorax much larger; the basal segment of the abdomen wider and shorter; and the sides of the 2nd segment subparallel; thus giving the body an oval instead of an elliptic form, as in *coitana*; apical fimbria golden brown; puncturation, &c., much as in *coitana*; beneath punctured, segments clothed with long hairs at the apex. Legs clothed with pale hairs; tarsi testaceous at the apex; scopæ clothed with golden hairs. Length 8—9 mm.

Hab. Has only occurred at present at Chobham, on *Erica*; and at Shipley, near Horsham.

40. *Andrena fulvago*, Christ.

Christ, Hym., p. 189, pl. xvi., fig. 7; Smith, Cat. Brit. Hym., 2nd ed., p. 59 = *constricta*, Smith, Cat. Brit. Hym., 2nd ed., p. 56.

Black; head and thorax clothed with fulvous hairs; clypeus black in both sexes. Abdomen shining, strongly punctured; apical fimbria bright golden. Posterior tibiæ and all the tarsi translucent, clear testaceous; scopæ clothed with bright golden hairs. Wings slightly dusky; nervures piceous.

♂. Face clothed with fulvous-brown hairs, with a line of darker ones on each side; clypeus largely and coarsely punctured; labrum simple. Antennæ reaching to about the scutellum; the joints at their bases, especially those towards the apex, with a narrow band of fine, pale, very short pubescence in front, giving the appearance of being banded with grey. Mesothorax rather densely clothed with fulvous-brown hairs, somewhat shining, strongly and deeply punctured. Metathorax finely rugose, rather sparingly clothed with fulvous hairs. Abdomen subovate, deeply punctured; 1st segment sometimes slightly constricted at the apex; 1st segment, base of 2nd, sides of all the segments, a line at the apex of the 3rd, 4th, and 5th, and the whole of the 6th and 7th, clothed with pale fulvous hairs; those of the 6th and 7th brighter and more golden; apex of each segment narrowly impressed and testaceous, the impressions nearly impunctate; beneath with the apex of each segment testaceous, clothed with long hairs, and with a dense fringe of golden hairs. Legs with golden hairs; posterior tibiæ and all the tarsi clear testaceous.

♀. Very like the ♂, but larger. Antennæ shorter, and without the grey pubescent bands. Thorax and abdomen much as in the ♂, but the 5th and 6th segments clothed with very bright golden hairs; ventral dorsal valve flat, punctured; beneath with the segments fringed with long golden hairs. Legs clothed with golden hairs; posterior tibiæ and all the tarsi very bright clear testaceous; the scopæ golden; the hairs long and plumose. Length 9—10 mm.

Hab. Not common; Chobham, Weybridge, Blackwater, Isle of Wight, Bristol, &c.

The var. of the ♂ with the 1st segment slightly constricted at the apex = *A. constricta*, Smith; it possesses

no other structural character, and is taken with the typical form.

41. *Andrena polita*, Smith.

Smith, Zool., v., p. 1733.

“♂. Length 5 lines. The pubescence on the clypeus white, above which it is pale fulvous; the cheeks have a long beard, and the mandibles a fringe of very pale pubescence; the femora have a fringe of the same colour; on the tibiæ and tarsi it is pale fulvous, the apical joints of the latter being pale ferruginous; on the disk of the thorax the pubescence is fulvo-ochraceous; the wings as in the ♀; abdomen oblong-ovate, very glossy, its pubescence as in the ♀; the margins of the segments depressed and narrowly rufo-testaceous.”

“♀. Length 5½ lines. Black; the face thinly clothed with fulvous pubescence, the flagellum fulvo-piceous beneath. Thorax: the disk thinly clothed with rufo-fulvous pubescence, on the metathorax and sides it is paler; the wings subhyaline, their apical margins clouded, the tegulæ rufo-testaceous; the pubescence of the legs fulvous, the scopæ bright fulvous, the floccus pale fulvous; the tarsi ferruginous. Abdomen shining, oblong-ovate, closely and delicately punctured; the apical margins of the segments obscurely rufo-testaceous; the 2nd, 3rd, and 4th segments having a narrow pale fulvous fringe, more or less obliterated in the middle; the 5th apical segment clothed with bright fulvous pubescence.”

Hab. “This beautiful species was discovered in the chalk-pits at Northfleet some years ago, in the month of July, where it has since been met with, but not in any other locality; it appears to be a rare insect.”

Not possessing this species, and not being able to refer to the typical specimens, I have copied out F. Smith's description from his ‘Catalogue of British Hymenoptera in Coll. Brit. Museum,’ pt. 1, 1855. It appears to be very distinct from any other of our British species.

Division VII.

- (4) 1. ♂, clypeus white. ♀, abdomen with anal fringe golden, unbanded, or strongly punctured.
 (3) 2. Abdomen without lateral white streaks *humilis*.
 (2) 3. Abdomen with lateral white streaks, strongly punctured.. *labialis*.

- (1) 4. ♂, clypeus black. ♀, anal fringe pale or golden, or dark, not strongly punctured, often banded.
- (8) 5. Species very small and black; pubescence silvery or grey; abdomen rarely banded.
- (7) 6. Abdomen not punctured *minutula*.
- (6) 7. Abdomen punctured *nana*.
- (5) 8. Species not very small; pubescence of thorax brown.
- (14) 9. Hairs of the face brownish or pale fulvous.
- (11) 10. Metathorax clathrately rugose at the base .. *proxima*.
- (10) 11. Metathorax finely rugose, not clathrate.
- (13) 12. ♂, abdomen with only short lateral white streaks.
♀ with a dense tuft of curved hairs on each side of the metathorax *dorsata*.
- (12) 13. ♂, abdominal bands almost entire. ♀, metathorax simply hairy at the sides *Afzeliella*.
- (9) 14. Hairs of the face below the antennæ silvery white *Wilkella*.

42. *Andrena humilis*, Imhoff.

Imhoff, Isis, 1832, ix., p. 1201 = *fulvescens*, Smith, Cat. Brit. Hym., 2nd ed., p. 60.

Black, clothed with ochreous hairs. ♂, clypeus white; abdomen dull in both sexes, very closely and rugosely punctured; anal fimbria golden; tibiæ and tarsi black, clothed with golden hairs. Wings slightly dusky; nervures testaceous.

♂. Vertex of head, face above the antennæ, and thorax above, clothed with dull ochreous-brown hairs, clypeus and under side of the thorax with white hairs. Clypeus white, with a black dot near each side. Mesothorax finely rugose and rugosely punctured. Metathorax finely rugose and clothed with hairs, except on the basal area. Abdomen clothed with long pale hairs on the basal segment and at the sides, with shorter pale hairs on the other segments, becoming golden on the 6th and 7th; surface rugose and rugosely punctured; apex of each segment smooth and somewhat piceous; beneath clothed with long pale hairs; apical ventral valve truncate and testaceous at its apex. Legs clothed with pale hairs.

♀. Face sparingly clothed with pale fulvous hairs. Mesothorax dull, finely rugulose and very closely punctured, with a few short pale hairs on its upper surface; beneath the wings clothed with long hairs. Scutellum somewhat shining and closely punctured. Metathorax

finely rugose, hairy at the sides. Abdomen nearly naked on the disk, finely rugose and rugosely punctured, dull; the apical margins of the segments impressed and smoother, the extreme apex piceous; 5th and 6th segments clothed with golden hairs; apical dorsal valve flat; beneath punctured, the segments fringed with pale hairs. Legs black, clothed with golden hairs; scopæ golden. Length 9—10 mm.

Hab. Local, but common in many places. Hampstead, Blackwater (Hants), Tunbridge Wells, Hastings, Isle of Wight, Bournemouth, near Liverpool, &c.

The ♂ is quite distinct from any other species by its hairy unbanded body and white clypeus; the ♀ can only be confounded with *fulvago*, but its black posterior tibiae and its dull rugose abdomen will easily distinguish it.

43. *Andrena labialis*, Kirby.

Kirby, Mon. Ap. Angl., ii., p. 148; Smith, Cat. Brit. Hym., 2nd ed., p. 62.

Black, clothed with greyish ochreous hairs. ♂, clypeus and sides of the face white. Abdomen closely and very finely punctured; 2nd, 3rd, and 4th segments with a white apical line. ♀ large, orbital impressions filled with pale golden pubescence. Abdomen with four pale pubescent bands; apical fimbria golden. Wings slightly dusky; nervures testaceous.

♂. Head punctured, clothed with brownish grey hairs; clypeus white, with a black dot on each side; sides of the face each with a white spot, adjoining the clypeus and extending upwards to about the level of the antennæ. Antennæ reaching to the scutellum. Mesothorax closely and rugosely punctured, clothed with brownish grey hairs. Metathorax with the basal area clathrate, the sides punctured and hairy. Abdomen dull, very closely punctured, especially towards the apex, clothed with short brownish grey hairs; 2nd, 3rd, and 4th segments with an apical line of white hairs, that of the 2nd and 3rd widely interrupted; 6th and 7th segments clothed with golden brown hairs; beneath punctured, apices of the segments piceous, and fringed with golden brown hairs; apical ventral valve longitudinally curved, looked at sideways, with its apex bifid (see pl. x., figs. 5a, 5b). Legs with greyish hairs; tarsi testaceous at the apex.

♀. Only differs from the ♂ in having, besides the ordinary sexual characters, the face black, the clypeus black and strongly punctured, the sides of the face clothed with pale hairs, and the orbital impressions filled with golden velvety pubescence; in having the thorax nearly naked on the disk, and the base of the metathorax more finely clathrate, the abdomen wider and the white bands more distinct, the apex of the 5th and the 6th segments clothed with bright golden hairs; apical dorsal valve flat and simple; beneath punctured, segments fringed at the apex with long golden hairs. Legs with pale golden hairs; tarsi testaceous at the apex. Length 11—14 mm.

Hab. Common and generally distributed.

44. *Andrena minutula*, Kirby.

Kirby, Mon. Ap. Angl., ii., p. 161; Smith, Cat. Brit. Hym., 2nd ed., p. 66 = *parvula*, Kirby, Smith, &c.

Small, black. Abdomen dull in both sexes, finely rugulose, but not punctured. Scopæ of ♀ silvery or brownish grey.

♂. Head and thorax finely rugulose and punctured; face clothed with long black hairs in the early spring form, with shorter grey ones in the summer and autumn form. Antennæ reaching to the scutellum. Mesothorax clothed with greyish brown hairs. Metathorax finely rugose, the rugosities longitudinal at the base, sides with long hairs. Abdomen finely rugulose, not punctured, the apex of each segment smooth and shining; surface clothed with short pale hairs; 2nd, 3rd, and 4th segments with a little white pubescence on each side at the apex, 6th and 7th segments clothed with white hairs with a slight golden tinge; beneath clothed with white hairs, apical ventral segment somewhat rounded. Legs black, with silvery grey hairs; tarsi piceous at the apex.

♀. Head clothed with pale yellowish grey hairs. Vertex longitudinally rugose. Clypeus largely punctured; orbital impressions filled with golden pubescence. Mesothorax finely rugulose and rather closely punctured. Metathorax finely rugose, its sides clothed with yellowish grey hairs. Abdomen ovate, finely rugulose, not punctured; 2nd and 3rd segments with a few silvery hairs on each side at the apex; 4th segment with an

entire apical band of silvery hairs; 5th and 6th segments clothed with golden brown hairs; apical dorsal valve triangularly raised in the centre and punctured, its margins slightly reflexed, smooth, and shining; beneath clothed with grey hairs. Legs black, clothed with grey hairs; scopæ silvery grey, with a more or less brownish tint; tarsi piceous at the apex. Length $5\frac{1}{2}$ —7 mm.

Hab. Common and generally distributed. Occurs as an early spring bee in April, and again in July and August.

Many authors have separated the spring and autumn forms as two species. The characters, however, are so slight that I think it is far more probable that they are only forms of one which is double-brooded.

In the spring form (*parvula*) the ♂ has the face densely clothed with black hairs, and the ♀ has the antennæ black, and the 1st segment of the abdomen slightly more rounded at the sides. In the summer form (*minutula*) the ♂ has the face with shorter grey hairs, and the ♀ has the antennæ slightly piceous beneath, and the 1st segment of the abdomen slightly less rounded at the sides.

45. *Andrena nana*, Kirby.

Kirby, Mon. Ap. Angl., ii., p. 161; Smith, Cat. Brit. Hym., 2nd ed., p. 67.

This species is exactly like the preceding in size and colour, and may easily be mistaken for it; the following characters will, however, distinguish it:—

In the ♂ the antennæ are rather longer, the mesothorax is rather less closely punctured, the abdomen is finely rugulose and also distinctly punctured, and the outer forceps of the genitalia are wider at the apex.

In the ♀ the mesothorax is slightly less rugulose, the abdomen punctured as in the ♂, and the white pubescence denser, forming more distinct bands. Length $5\frac{1}{2}$ —7 mm.

Hab. Common and generally distributed. Occurs in May, June, and July.

46. *Andrena proxima*, Kirby.

Kirby, Mon. Ap. Angl., ii., p. 146 = *Collinsonana*, Kirby, Smith, &c.

Black; clothed with greyish hairs on the head and thorax in the ♂, with pale brown in the ♀. Abdomen very finely rugulose and remotely punctured; 2nd, 3rd, and 4th segments with a lateral streak of pale hairs at the apex; apical fimbria golden. Legs black; tarsi piceous. ♀; scopæ brownish grey. Wings dusky.

♂. Face clothed with brownish grey hairs. Antennæ reaching to the scutellum. Mesothorax dull, finely rugulose, and rather closely punctured, clothed with brownish grey hairs. Metathorax somewhat clathrately rugose, basal area undefined. Abdomen shining, segments much impressed at the apex, finely punctured and clothed with short grey hairs; sides of all the segments and an apical band on each of the 1st, 2nd, 3rd and 4th clothed with long semi-erect white hairs; 6th and 7th segments clothed with white hairs with a slight golden tinge; beneath finely punctured, segments pale at the apex, and fringed with long white hairs; apical ventral valve somewhat truncate. Legs clothed with grey hairs; tarsi piceous towards the apex.

♀. Head and thorax clothed with brownish grey hairs. Mesothorax dull, rather closely and largely punctured. Metathorax finely and clathrately rugose, basal area ill-defined. Abdomen slightly shining, very finely rugulose and remotely punctured, segments with a wide impunctate apical impression, the 2nd, 3rd, and 4th with a lateral streak of white hairs at the apex, 5th and 6th clothed with golden brown hairs; apical dorsal valve with its sides slightly reflexed; beneath punctured; apex of each segment narrowly testaceous and fringed with long brownish-grey hairs. Legs black, clothed with greyish hairs; scopæ silvery, with a slight brownish tinge; tarsi testaceous towards the apex. Length 9—10 mm.

Hab. Rare. Occurs in June, and has been taken at Norwich, Weybridge, Blackwater (Hants), Hastings, Bristol, and Sidmouth.

47. *Andrena dorsata*, Kirby.

Kirby, Mon. Ap. Angl., ii., p. 144 ; Smith, Cat. Brit. Hym., 2nd ed., p. 68 = *combinata*, Kirby, Smith, &c. Var. = *connectens*, Kirby ?

Black. Mesothorax clothed with bright fulvous hairs. ♂ ; abdomen shining, punctured, scarcely rugulose, elongate-elliptic. ♀ ; abdomen ovate, 2nd and 3rd segments with a lateral streak, and 4th with an apical band of white or very pale fulvous pubescence ; 5th and 6th segments clothed with brown hairs ; posterior tarsi in both sexes, and often the tibiae, more or less testaceous. Wings slightly clouded at the apex ; nervures pale testaceous.

♂. Face densely clothed with pale fulvous hairs. Antennæ reaching to the post-scutellum ; 3rd joint short, scarcely longer than it is wide across the apex. Mesothorax clothed with fulvous hairs, dull and finely rugulose, and with rather large distinct punctures. Metathorax rugose, its basal area well defined ; sides with long, pale, fulvous hairs. Abdomen shining, finely punctured, scarcely rugulose, clothed with pale hairs on the two basal segments, and with very short dark ones on the 3rd and 4th ; 5th, with a few black ones at the base, its apex and the 6th and 7th clothed with pale fulvous hairs ; apex of each segment piceous, that of the 2nd, 3rd, and 4th with a little pale fulvous pubescence on each side ; beneath punctured and finely rugulose, the segments rather widely pale at the apex, and clothed with long pale hairs ; apical ventral valve subtruncate at the apex. Legs clothed with pale fulvous hairs ; all the tarsi, and more or less of the apex of the posterior tibiae in the autumn form, and the posterior tarsi only in the spring form, pale testaceous.

♀. Face clothed at the sides and round the antennæ with pale fulvous hairs ; orbital impressions filled with dark brown velvety pubescence. Mesothorax clothed with bright fulvous hairs, finely rugulose and punctured. Metathorax rugose, basal area clearly defined, and with a slightly raised dorsal line, sides with a dense tuft of curved pale fulvous hairs. Abdomen ovate, very finely punctured, the apex of each segment very narrowly piceous ; basal segment with a few fulvous hairs on each side, 2nd and 3rd with a streak of white or very pale fulvous hairs on each side at the apex, 4th with an entire

apical streak, 5th and 6th clothed with golden brown hairs; beneath clothed with grey hairs. Legs with pale fulvous hairs; posterior tarsi, and the apex of the posterior tibiæ also (in the spring form) clear testaceous; apical joints of all the tarsi testaceous. Length 9—11 mm.

Hab. On sallows in spring, and blackberry flowers in summer. A local species, but occurring at Norwich, Southwold, Chobham, Bournemouth, and in Devonshire.

This is, I believe, another double-brooded species considered by some authors as constituting two, but the distinguishing characters are so slight and almost exclusively those of coloration that I have no hesitation in uniting the forms to which they belong.

48. *Andrena Afzeliella*, Kirby.

Kirby, Mon. Ap. Angl., ii., p. 169; Smith, Cat. Brit. Hym., 2nd ed., p. 71.

Var. *fuscata*, Kirby, Smith.

Var. (styloized) *convexiuscula*, Kirby, Smith, &c.

Black. ♂ with the head and thorax clothed with pale fulvous hairs, thorax of the ♀ with fulvous-brown hairs; segments of the abdomen in the ♂ with pale fulvous-brown apical fasciæ, interrupted on the 2nd and 3rd. Abdomen in ♀ short and ovate, 2nd, 3rd, and 4th with a whitish apical fringe, that of the 2nd interrupted; apical fimbria brown; posterior tibiæ of ♀ generally testaceous.

♂. Head and thorax densely clothed with pale fulvous-brown hairs. Antennæ reaching to about the base of the metathorax; 3rd joint distinctly shorter than 4th. Mesothorax finely rugulose and punctured. Metathorax finely rugose. Abdomen ovate, dull, finely rugulose and punctured; base of the 1st segment and sides of the others with long scattered pale hairs; each segment with an apical band of pale hairs, that on the 1st segment widely, that on the 2nd narrowly, interrupted in the middle; 6th and 7th segments entirely clothed with pale golden hairs; segments beneath widely pale at the apex, clothed with long pale hairs; apical ventral valve somewhat rounded at the extremity. Legs clothed with pale hairs; posterior tarsi and base of the tibiæ sometimes testaceous.

♀. Face short, transverse, clothed with pale fulvous hairs. Mesothorax clothed with fulvous-brown hairs, very finely rugulose and punctured. Scutellum rather more shining than the mesothorax, punctured. Metathorax finely rugose, clothed with pale fulvous hairs, especially at the sides. Abdomen short, ovate, dull, very finely rugulose and finely punctured; basal segment with a few pale hairs on each side at the apex, 2nd segment with a widely interrupted apical band, 3rd and 4th segments with entire apical bands of short pale fulvous, or sometimes nearly white, hairs, 5th segment, except at the base, and the 6th densely clothed with dark brown hairs; segments beneath narrowly testaceous at the apex, and fringed with pale hairs. Legs clothed with pale hairs, intermediate tibiæ with brown; posterior tibiæ and tarsi generally pale testaceous, but sometimes dark; scopæ golden. Length 8—10 mm.

Hab. Common and generally distributed. Occurs in April, and also often in the autumn.

I regard *convexiuscula*, Kirby, as only a stylopedized variety of this species.

49. *Andrena Wilkella*, Kirby.

Kirby, Mon. Ap. Angl., ii., p. 145 = *xanthura*, Kirby, Smith, &c. (ex. ♂ ?), Cat. Brit. Hym., 2nd ed., p. 74; ♂ = *similis*, Smith.

This species is very closely allied to *Afzeliella*, but is, I believe, clearly distinct by the following characters:—

♂. Hairs of the face below the antennæ silvery white; 3rd joint of antennæ longer than the 4th, or at least as long. Mesothorax clothed with bright fulvous hairs, with a larger, deeper puncturation. Abdomen without transverse bands, deep black, with a very fine short white pubescence, and only slight indications of apical bands at the extreme sides of the 2nd and 3rd segments; apical ventral valve somewhat truncate; apex of posterior tibiæ and the tarsi testaceous.

♀. Larger than *Afzeliella*; the face less transverse, and clothed below the antennæ with silvery white hairs. Mesothorax and post-scutellum clothed with very bright rich fulvous hairs. Wings rather dusky. Abdomen more elongate, 1st segment less transverse, apical fasciæ of the 2nd and 3rd segments interrupted, and composed of rather longer hairs; apical fimbria bright golden;

posterior tibiæ and tarsi and intermediate tarsi clear testaceous. Length 9—12 mm.

Hab. Generally distributed and common in some localities. The ♂ which I have referred to this species is that which F. Smith describes under the name *similis*. I take it in April and May on Wandsworth Common in the same locality as the ♀, and the white silvery pubescence of the face is so alike in the two sexes that I feel convinced that they belong to the same species. The ♂, which F. Smith describes under *xanthura*, is, I believe, a variety of *Afzeliella*. I have adopted the name of *Wilkella* for this species, as it precedes that of *xanthura* in Kirby's Monograph.

MACROPIS, Panz.

Panz., Faun. Germ., 107, 16. For figures of generic characters see F. Smith, Cat. Brit. Hym., 2nd ed., pl. vi.

Labial palpi 4-jointed. Maxillary palpi 6-jointed. Anterior wings with two submarginal cells; posterior femora and tibiæ in the ♂, and tibiæ and metatarsi in the ♀, dilated. Abdomen black, shining.

We have only one species of this genus, which cannot be confounded with anything else. The only other genus with two submarginal cells belonging to this section of the Acutilingues is *Dasyppoda*, whose elongate hairy body and simple legs will distinguish it at once.

1. *Macropis labiata*, Fabr.

Fabr., Syst. Piez., p. 333; Smith, Cat. Brit. Hym., 2nd ed., p. 104.

Black, shining; face of ♂ white; labrum black. Abdomen with a narrow apical band on the 3rd and following segments. ♂, tibiæ dilated; scopæ of ♀ yellowish white; metatarsi black. Wings rather smoky.

♂. Head and thorax largely and closely punctured, clothed with brownish hairs; face below the antennæ, a spot on the mandibles near the base, and sometimes one on the scape of the antennæ, yellowish white. Antennæ reaching to the base of the abdomen, fulvous beneath. Metathorax coarsely rugose at the base. Abdomen very shining, largely and distantly punctured on the 1st and 2nd segments, more closely on the following; 3rd, 4th,

and 5th segments with an apical band of snow-white hairs, interrupted on the 3rd; centre of the 7th segment raised, produced at the apex beyond the sides; beneath very shining, 3rd and 4th segments with a golden fringe, 5th largely emarginate, the emargination fringed with short hairs, 6th densely clothed with short golden hairs, (for 7th, 8th, and genitalia see pl. x., figs. 1, 1a—d). Legs clothed with pale hairs; tarsi piceous; posterior femora swollen, punctured; tibiæ dilated, the upper margin curved, the lower margin somewhat produced near the apex, and then slightly sinuate (see pl. x., figs. 1e, 1f), calcaria pale; tarsi very short.

♀. Rather shorter than the ♂; face black, and the antennæ shorter; the thorax less hairy; the abdomen shorter, with an interrupted snow-white streak on the 3rd segment, and an entire one on the apex of the 4th, the 5th with sooty hairs, the 6th with black; beneath, the 2nd, 3rd, and 4th segments are fringed at the apex with golden hairs, the 5th and 6th with brown. Legs clothed with brown hairs; posterior pair with the scopæ yellowish white; metatarsi dilated, densely clothed with black hairs; tarsi piceous at the apex. Length 9—10 mm.

Hab. Very rare. Mr. Bridgman has taken both sexes at Norwich off thistles; the other known British localities are the New Forest and Weybridge.

DASYPODA, Latr.

Latr., *Hist. Nat.*, iii., p. 372. For figures of generic characters see F. Smith, *Cat. Brit. Hym.*, 2nd ed., pl. vii.

Labial palpi 4-jointed. Maxillary palpi 6-jointed. Anterior wings with two submarginal cells. Body hairy; posterior tibiæ and metatarsi, especially in the ♀, clothed with very long hairs; tibia destitute of a patella.

A very distinct genus; the ♂ looks rather like a large elongate *Andrena*, but the want of the 3rd submarginal cell is a distinct characteristic.

1. *Dasypoda hirtipes*, Latr.

Latr., *Hist. Nat.* xiii., p. 369; Smith, *Cat. Brit. Hym.*, 2nd ed., p. 103.

Black; ♂ clothed with pale fulvous hairs; each segment of the abdomen with a pale fulvous apical band; ♀ with the thorax clothed with fulvous hairs, with a

black band across the centre. Abdomen with a band of white hairs at the apex of the 2nd, 3rd, and 4th segments; apical fimbria black. Posterior tibiæ and metatarsi clothed with very long bright golden-fulvous hairs. Wings slightly dusky.

♂. Head and thorax densely clothed with pale fulvous hairs, that on the face and below the wings paler. Antennæ entirely black, reaching nearly to the scutellum. Abdomen with the first three segments clothed nearly entirely with long pale hairs, the following three with black hairs at the base and a pale band at the apex, the 7th with black hairs; beneath with pale hairs, the 5th with black, 6th nearly glabrous; (for 7th, 8th and genitalia see pl. xi., figs. 3, 3a, 3b). Legs clothed with very long pale hairs; tarsi beneath with bright fulvous hairs.

♀. Vertex of the head clothed with black hairs, face below the antennæ with grey. Mesothorax with black hairs across the disk and fulvous-brown hairs round it; beneath with pale fulvous-grey hairs. Abdomen shining; apex of each segment smooth and piceous, pubescence of the basal segment pale, that of the others black, the 2nd, 3rd, and 4th with a subapical band of white hairs, the upper two narrowly interrupted, 5th and 6th segments densely clothed with erect grey-black hairs; beneath with the segments densely fringed at the apex with sooty black hairs. Anterior legs clothed with dark hairs in front and pale behind; intermediate legs with brown hairs, posterior with fulvous, the scopæ and metatarsi being covered with extremely long, bright, golden-fulvous hairs, which give the insect a character distinguishing it at once from any other of our British Hymenoptera; tarsi piceous at the apex. Length 15—16 mm.

Hab. This beautiful insect is not rare in sandy localities, and seems to be pretty well distributed over the South of England, especially along the coast. It appears in July and August.

CILISSA, *Leach.*

Leach, Ed. Enc. ix., p. 155. For figures of generic characters see F. Smith, Cat. Brit. Hym., 2nd. ed., pl. vii.

Labial palpi 4-jointed. Maxillary palpi 6-jointed. Anterior wings with three submarginal cells. Apical joint of the antennæ obliquely truncate.

A genus very closely allied to *Andrena*, but distinguished by the truncature of the apical joint of the antennæ.

- | | | | |
|---|----------------------------|---------|-------------------------|
| 1. ♂; abdomen without distinct pale apical bands to the segments. | ♀; anal fringe golden | .. | <i>hæmorrhoidalis</i> . |
| 2. ♂; abdomen distinctly banded. | ♀; anal fringe black-brown | | <i>leporina</i> . |

1. *Cilissa hæmorrhoidalis*, Fabr.

Fabr., Syst. Ent., p. 377; Smith, Cat. Brit. Hym., 2nd ed., p. 76.

Black; ♂ clothed with pale greyish brown hairs, ♀ with fulvous-brown. Abdomen not distinctly banded; ♀, scopæ and anal fringe golden-fulvous. Wings nearly clear.

♂. Head and thorax clothed with pale brownish grey hairs, those on the disk of the mesothorax nearly black. Antennæ with the joints very arcuate, apical joint diagonally truncate. Mesothorax punctured. Metathorax finely rugose. Abdomen largely punctured, clothed with pale hairs, intermixed with a few black ones on the base of the 3rd and following segments; beneath clothed with pale hairs; 6th ventral segment narrow and angularly produced at the sides, clothed with golden hairs, 8th ventral with the apex truncate and dilated, the truncature circular or nearly so; (for 7th and 8th ventral segments and genitalia see pl. xi., figs. 1, 1a, 1b). Legs with pale hairs; tarsi piceous at the apex, clothed with golden hairs beneath.

♀. Rather larger and wider than the ♂, the pubescence darker and more fulvous; puncturation, &c., of thorax as in the ♂. Abdomen rather more finely punctured, dull; 1st segment short, subtruncate at the base, all the segments clothed with short pale hairs, 3rd and 4th with a very narrow apical fringe of paler hairs, 5th and 6th clothed with bright golden-fulvous hairs; beneath rather densely clothed with long golden hairs. Legs piceous, clothed with fulvous hairs; scopæ and posterior tarsi bright fulvous. Length 12—15 mm.

Hab. Frequents the bells of *Campanula rotundifolia*, and has occurred at Shirley, Norwich, Chobham, Kingsdown near Deal, Weybridge, Bournemouth, Bath, Bristol, Devonshire, &c.

2. *Cilissa leporina*, Panz.

Panz., Faun. Germ., 63, 21; Smith, Cat. Brit. Hym., 2nd ed., p. 77.

Black, clothed with pale fulvo-ochraceous hairs. Abdomen with pale apical bands to the segments; anal fimbria black; scopæ of ♀ pale ochreous-grey. Wings nearly clear.

♂. Head and thorax punctured, clothed with very pale ochreous hairs, intermixed with black on the disk of the mesothorax. Antennæ slightly piceous beneath, apical joint diagonally truncate. Metathorax finely rugose. Abdomen rugosely punctured; 1st and 2nd segments densely clothed with pale hairs, 3rd and following segments with black hairs at the base and a band of pale hairs at the apex; beneath with pale hairs; apical ventral valve dilated at the apex and truncate, the truncature nearly circular; (for 6th, 7th and 8th ventral segments and genitalia see pl. xi., figs. 2, 2a, 2b). Legs clothed with pale hairs; tarsi testaceous towards the apex.

♀. With the pubescence rather darker and browner than that of the ♂. Head and thorax punctured, &c., as in that sex. Abdomen wider, the pubescence shorter; 1st and 2nd segments clothed all over with pale hairs, 3rd and 4th with black hairs at the base and a well-marked band of pale hairs at the apex, 5th and 6th clothed with black hairs, the 5th with a tuft of pale ones on each side, beneath clothed with pale; 5th and 6th segments with black-brown hairs. Legs with pale hairs; tarsi at the apex testaceous, and clothed beneath with fulvous hairs. Length 12—14 mm.

Hab. Not rare in July and August. I have taken it at Hastings, Littlehampton, Bournemouth, and Chobham; and it has also occurred at Hampstead, Gravesend, Erith, Deal, and Norwich.

EXPLANATION OF PLATES.

PLATE VII.

- FIG. 1. *Colletes fodiens*. ♂ armature, dorsal view.
 2. " *cunicularia* " "
 3. " *picistigma* " "
 4. *Prosopis cornuta* " showing 7th and 8th
 ventral plates.
 5. " *pictipes* " "
 6. " *brevicornis* " dorsal view.
 7. " *signata* " "
 8. " *confusa* " "
 9. " *communis* " "
 10. " *hyalinata* " showing 8th ventral plate.
 11. " *dilatata* " dorsal view.
 12. " *punctulatissima* " "
 13. *Colletes marginata* " "
 14. " *succincta* " "
 15. " *Daviesana* " "

PLATE VIII.

1. *Sphecodes puncticeps*. ♂ armature, dorsal view.
 1a. " " " apical view.
 2, 2a. " *subquadratus* " dorsal and apical
 views.
 3, 3a. " *gibbus* " "
 4, 4a. " *similis* " "
 5, 5a. " *pilifrons* " "
 6, 6a. " *ephippium* " "
 7, 7a. *Halictus quadricinctus* " "
 8, 8a. " *rubicundus* " "
 9, 9a. " *zonulus* " "
 10, 10a. " *leucozonius* " "
 11, 11a. " *quadrinotatus* " "
 12, 12a. " *maculatus* " "
 13, 13a. " *xanthopus* " "
 14, 14a. " *sennotatus* " "

PLATE IX.

FIG. 1.	<i>Halictus cylindricus</i> , ♂ armature, dorsal view.		
1a.	“	“	apical view.
2, 2a.	“	<i>morio</i> ,	dorsal and apical views.
3, 3a.	“	<i>leucopus</i>	“
4, 4a.	“	<i>malachurus</i>	“
5, 5a.	“	<i>Sneathmanellus</i>	dorsal and apical views.
6, 6a.	“	<i>tumulorum</i>	“
7, 7a.	“	<i>puncticollis</i>	“
8, 8a.	“	<i>albipes</i>	“
9, 9a.	“	<i>prasinus</i>	“
10, 10a.	“	<i>pauillus</i>	“
11, 11a.	“	<i>longulus</i>	“
12, 12a.	“	<i>subfasciatus</i>	“
13, 13a.	“	<i>punctatissimus</i>	“
14, 14a.	“	<i>brevicornis</i>	“
15, 15a.	“	<i>villosulus</i>	“
16, 16a.	“	<i>nitidiusculus</i>	“
17, 17a.	“	<i>minutus</i>	“
18, 18a, 18b.	“	<i>laevigatus</i>	dorsal, apical, and lateral views.
19, 19a.	“	<i>atricornis</i>	dorsal and apical views.
20, 20a.	“	<i>minutissimus</i>	“

PLATE X.

1.	<i>Macropis labiata</i> , ♂ armature, dorsal view.		
1a.	“	“	apical view.
1b.	“	“	7th ventral segment.
1c.	“	“	8th ventral segment.
1d.	“	“	“ lateral view.
1e.	“	“	posterior tibiæ, external side.
1f.	“	“	posterior tibiæ, internal side.
2.	<i>Sphcodes subquadratus</i> , ♂ antenna.		
3.	“	<i>pilifrons</i> ♂	“
4.	<i>Andrena cingulata</i> , ♂ armature, dorsal view.		
4a.	“	“	apical view.
5.	“	<i>labialis</i>	“
5a.	“	“	8th ventral segment.
5b.	“	“	“ lateral view.

